THE PHYSICAL REVIEW

VOLUME 179 *Second Series* INDEX

MARCH 1969

Published for

THE AMERICAN PHYSICAL SOCIETY

by the

AMERICAN INSTITUTE OF PHYSICS

LANCASTER, PA., AND NEW YORK, N. Y.

Information for Contributors

Send manuscripts to the Editors, *The Physical Review*, Brookhaven National Laboratory, Upton, N. Y. 11973.

Consult recent issues of this journal and the American Institute of Physics Style Manual (second revised edition, 1967) for the general format and style of articles. Specify section and index categories. [See Phys. Rev. 153, 1728 (1967).]

The manuscript, including the abstract, references, and captions should be neatly typed in English, double spaced on good letter-size (8½ in. × 11 in.) white paper with ample margins to allow for editorial marking. It should be carefully proofread by the author for misspellings, grammatical errors, and missing symbols. Unclear or excessive handwritten insertions are not acceptable. A duplicate copy of the manuscript must be furnished.

The title should be concise but informative enough to facilitate information retrieval. The abstract should be self-contained for reprinting in Abstract Journals. It should be adequate as an index (giving all subjects, major and minor, about which new information is given) and as a summary (giving the conclusions and all results of general interest in the article). It should be about 5% of the length of the article but less than 500 words.

Equations should be neatly typed or written in ink, punctuated and aligned to bring out their structure, and numbered on the right. Mathematical operation signs indicating continuity of the expression should be placed at the left of the second and succeeding lines.

Notation should be chosen so as to be clear, compact, and consistent with standard usage. The prime requisite is that the copy be as clear as possible to the typesetter, who is neither a physicist nor a mathematician. To this end a certain amount of editorial copymarking is necessary. All unusual symbols should be identified the first time they are used, and at subsequent times when confusion might arise. Boldface symbols should be marked by a wiggly black underline always. Handwritten symbols should be identified as capital or lower case. Handwritten Greek symbols should be identified in the margin the first time and underscored in red later if confusion is possible. (This is particularly important for those symbols such as χ or κ which may look, when handwritten, like italic symbols, x or k; or for capital Σ and Π which can be confused with the summation or product symbols, themselves oversize special characters.) German, script, or sans-serif letters should be identified the first time in the margin and later underscored in green if they may be confused with other letters.

Because of the monotype system of typesetting used by *The Physical Review*, in which each character, on a separate piece of type, can only be placed adjacent to and not above or below another character, certain expressions cannot be handled. Superscripts cannot be placed above subscripts. In fact, superscripts should be placed after subscripts except where the meaning would be affected (e.g., in general relativity). Where there is doubt as to the position of the superscript or subscript, a sharp black-pencilled caret or inverted caret should be used to indicate the position. Bars cannot be placed over more than one symbol. Where the bar denotes an average we usually recommend the notation $\langle\ \rangle_{\rm Av}$ and where the bar is part of a root sign we require the use of fractional exponents. Also, special markings such as tildes, bars, carets, and dots cannot be placed over symbols unless that symbol with the appropriate marking already exists as a separate piece of type.

A list of the available symbols is given on pp. 21 through 26 of the AIP *Style Manual*. Note that if a symbol is available "on the line" it is not necessarily available as a superscript or subscript unless specifically indicated.

The solidus should be used instead of built-up fractions to save vertical space where clarity would not be jeopardized. This is of particular importance in the running text. Also the "exp" notation should be used where complicated exponents exist.

References *including comments* must be numbered consecutively in order of first appearance in the text and should be given in a separate double-spaced list at the end of the text material. References to tables should be designated by lower case roman letters and given at the end of the table. The proper form for references will be found on p. 7 of the AIP *Style Manual* and in recent issues of this journal.

Numbered tables should be used for all but the simplest tabular material; they should have suitable captions which make the tables intelligible without reference to the text. The table structure should be clear, with simple column headings giving all units. The tables should be numbered in the order in which they are referred to in the text.

Figures should be planned for the 3-in. column width of *The Physical Review*. In some cases where the figures contain a great deal of detail, 1½ or 2 columns may be used. The lettering and data points on the figures should be large and clear enough so that they will be legible after reduction (the final size should be at least ⅛ in. ~1.5 mm). Waste space at the top and bottom should be avoided. Figures should be numbered in the order in which they are referred to in the text. A separate list of captions should be supplied. The figure itself should have properly labeled axes with correctly abbreviated units. [For unit abbreviations see AIP *Style Manual*, pp. 9–11.] Figures should be identified on the back by the number, the name of the first author, and the journal.

Because of the zinc-etching or copper-halftone processes used in making figures, a maximum black-white contrast is necessary. We require original india-ink drawings or good, clear glossy prints. The latter are preferable to oversized originals. Avoid small open symbols which tend to fill in upon reduction, small dots which barely reproduce, and toned shading which fails to reproduce well in engraving. Photographs of apparatus are unacceptable and should be replaced by good schematic diagrams. For complete instructions on preparation of illustrations see AIP *Style Manual*, pp. 27–32.

After notification of acceptance, all correspondence regarding proofs, etc. should be addressed as follows: *Papers in Issue No. 1:* The Physical Review, 150 Central Ave., Farmingdale, L. I., N. Y. 11735; *Papers in Issues No. 2–5:* Supervisor, Editorial Department, American Institute of Physics, 335 East 45th Street, New York, N. Y. 10017. Reference *must* be made to journal, scheduled issue, title, and first author. Authors will be charged for alterations made in proof and, in the case of excessive alterations, the manuscript will be returned to the Editorial Office for reconsideration.

10-31-68

THE PHYSICAL REVIEW

A journal of experimental and theoretical physics established by E. L. Nichols in 1893

VOLUME 179

Second Series

MARCH 1969

Published for

THE AMERICAN PHYSICAL SOCIETY

by the

AMERICAN INSTITUTE OF PHYSICS

THE PHYSICAL REVIEW

A journal of experimental and theoretical physics established by E. L. Nichols in 1893.

Published by the
American Institute of Physics
for

The American Physical Society

Officers

President
L. W. ALVAREZ
University of California
Berkeley

Vice-President
E. M. PURCELL
Harvard University

Vice-President Elect
ROBERT SERBER
Columbia University

Treasurer
S. L. QUIMBY
Columbia University

Deputy Treasurer
J. A. BURTON
Bell Telephone Laboratories

Executive Secretary
W. W. HAVENS, JR.
Columbia University

Secretary Emeritus
K. K. DARROW
Bell Telephone Laboratories
(*retired*)

Regional Secretaries
Central States, MURRAY PESHKIN
Argonne National Laboratory
Western States, WARD WHALING
California Institute of Technology
Southwest & Mountain States,
JAMES PHILLIPS
Los Alamos Scientific Laboratory
Southeastern States,
L. W. SEAGONDOLLAR
North Carolina State University

Editor in Chief
S. A. GOUDSMIT
Brookhaven National Laboratory

Office of the Society
American Institute of Physics
335 East 45 Street
New York, N. Y. 10017

Editors

S. PASTERNACK A. W. K. METZNER J. R. ROESSER

Assistants to the Editors

J. C. FINEMAN R. W. JONES J. KERWIN

Manuscripts for publication should be submitted to the Editors, *The Physical Review*, Brookhaven National Laboratory, Upton, N. Y. 11973. The author's institutions are requested to pay a publication charge of $75 per page which, if honored, entitles them to 100 free reprints. An additional $10 will be requested for publication of the abstract in *Physics Abstracts*

Proof and all correspondence concerning papers in the process of publication should be addressed as follows:

Papers in Issue No. 1: The Physical Review, 150 Central Ave., Farmingdale, L. I., N. Y. 11735.

Papers in Issues No. 2–5: Supervisor, Editorial Department, American Institute of Physics, 335 East 45 Street, New York, N. Y. 10017.

Reference must be made to title, author, journal, and scheduled date of publication.

Annual Subscription Prices

	U.S.A., Canada, and Mexico	Elsewhere
Members of the American Physical Society:		
Sec. 1 or 2 or 3 or 4 or 5	$ 15.00	$ 18.00
All numbers	50.00	65.00
(Only one copy of each index issue will be sent to each subscriber, regardless of the number of sections ordered.)		
Nonmembers (*Individual sections may be subscribed to only as a supplement to a full subscription.*):		
All numbers	100.00	115.00
Sec. 1 or 2 or 3 or 4 or 5	30.00	33.00

Back Numbers

Yearly back-number rate when complete year is available:	
1953 through 1963, inclusive	$ 48.00
1964 through 1968, inclusive	65.00
1969 and thereafter	130.00
Single-copy back-number rate:	
1953 through 1968, inclusive	2.00
1969 and thereafter	3.00
Single copies of monthly index issues:	
1964 through 1968, inclusive	2.00
1969 and thereafter	3.00
Semiannual cumulative indexes:	
1964 through 1968, inclusive	2.00
1969 and thereafter	3.00

Subscriptions, renewals, orders for back numbers, and changes of address should be addressed to the Circulation Department, American Institute of Physics, 335 East 45 Street, New York, N. Y. 10017. For a change of address, allow at least six weeks' advance notice; send both old and new addresses and, if possible, please include an address stencil imprint from the mailing envelope of a recent issue.

Permission is granted to quote from this journal in scientific articles, with the customary acknowledgment of the source. Reproduction of figures and tables is permitted provided that the author's consent is obtained and that the editorial office is notified. Reproduction of whole articles for commercial purposes requires written permission of both Editor and author.

The Physical Review is published five times a month (on the 5th, 10th, 15th, 20th, and 25th of each month), at Prince and Lemon Streets, Lancaster, Pa. 17604.

Author Index to Volume 179

In this index complete paper citations are given under the name of each participating author, eliminating "See" references. Papers are arranged in ascending order of page numbers.

Adair, R. K.
Proton-Proton Triple Scattering at 1.9 GeV—W. C. Carithers, Jr., R. K. Adair, C. J. B. Hawkins, H. Kasha, R. C. Larsen, L. B. Leipuner, L. W. Smith and T. P. Wangler. **179**, 1304 (1969)

Ademollo, M.
Anomalous Magnetic Moments of Nucleons and Sidewise Dispersion Relations—M. Ademollo, R. Gatto and G. Longhi. **179**, 1601 (1969)

Aitken, D. W.
Energy Loss and Straggling in Silicon by High-Energy Electrons, Positive Pions, and Protons—D. W. Aitken, W. L. Lakin and H. R. Zulliger. **179**, 393 (1969)

Alburger, D. E.
Beta Decays of C^{15}, F^{17}, and F^{20}—A. Gallmann, F. Jundt, E. Aslanides and D. E. Alburger. **179**, 921 (1969)

Alexander, E. C., Jr.
Xenon and Krypton from the Spontaneous Fission of Californium-252—B. Srinivasan, E. C. Alexander, Jr., O. K. Manuel and D. E. Troutner. **179**, 1166 (1969)

Alford, W. P.
Multipole Analysis of Particle-Particle or Particle-Hole Multiplets—M. Moinester, J. P. Schiffer and W. P. Alford. **179**, 984 (1969)

Allen, J. W.
Magnetic Davydov Splittings in the Optical Absorption Spectrum of Cr_2O_3—J. W. Allen, R. M. Macfarlane and R. L. White. **179**, 523 (1969)

Allen, R. E.
Calculation of Dynamical Surface Properties of Noble-Gas Crystals. I. The Quasiharmonic Approximation—R. E. Allen and F. W. de Wette. **179**, 873 (1969)
Calculation of Dynamical Surface Properties of Noble-Gas Crystals. II. Molecular Dynamics—R. E. Allen, F. W. de Wette and A. Rahman. **179**, 887 (1969)

Altick, P. L.
Extension of the Integral Formulation of Scattering Theory to Coulomb Interactions—P. L. Altick. **179**, 71 (1969)

Ammar, R.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)

Anderson, J. W.
Anisotropy of the Superconducting Energy Gap in Th—J. W. Anderson, D. T. Peterson and D. K. Finnemore. **179**, 472 (1969)

Appleton, B. R.
Potential-Energy and Differential-Stopping-Power Functions from Energy-Loss Spectra of Fast Ions Channeled in Gold Single Crystals—S. Datz, C. D. Moak, T. S. Noggle, B. R. Appleton and H. O. Lutz. **179**, 315 (1969)

Arko, A. J.
Low-Temperature Resistivity in a "Giant" Moment Alloy—L. Shen, D. S. Schreiber and A. J. Arko. **179**, 512 (1969)

Arndt, Richard A.
Phase-Shift Analysis of High-Precision (p,p) Differential Cross-Section Data at 6.141, 8.097, and 9.918 MeV—Malcolm H. MacGregor, Richard A. Arndt and Robert M. Wright. **179**, 1624 (1969)

Ascarelli, G.
Dynamic Piezo-Optic Study of Exciton and Polaron States in AgBr—G. Ascarelli. **179**, 797 (1969)

Ascoli, G.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)

Aslanides, E.
Beta Decays of C^{15}, F^{17}, and F^{20}—A. Gallmann, F. Jundt, E. Aslanides and D. E. Alburger. **179**, 921 (1969)

Atzmony, U.
Anisotropy of the Europium-Iron Exchange Interaction in Rare-Earth Iron Garnets—U. Atzmony, E. R. Bauminger, A. Mustachi, I. Nowik, S. Ofer and M. Tassa. **179**, 514 (1969)

Bagus, P. S.
Multiconfiguration Hartree-Fock Calculations. II. Calculation of the Lowest ^3P, ^1D, and ^1S States of the Carbon Atom—P. S. Bagus, N. Bessis and C. M. Moser. **179**, 39 (1969)

Bailey, P. T.
Direct-Transition Optical Absorption in PbS, PbSe, and PbTe from Relativistic Augmented-Plane-Wave Functions—P. T. Bailey, M. W. O'Brien and S. Rabii. **179**, 735 (1969)

Bainbridge, Kenneth T.
Influence of Superconductivity on the Half-Life of Niobium-90^m—Arthur Olin and Kenneth T. Bainbridge. **179**, 450 (1969)

Bair, J. K.
Level Structure in ^{15}O from the Proton Bombardment of ^{14}N—M. L. West, C. M. Jones, J. K. Bair and H. B. Willard. **179**, 1047 (1969)

Baird, J. K.
Improved Upper Limit to the Electric Dipole Moment of the Neutron—J. K. Baird, P. D. Miller, W. B. Dress and Norman F. Ramsey. **179**, 1285 (1969)

Balling, Ludwig C.
Phase-Shift Calculation for Low-Energy Electron-Rb Scattering—Ludwig C. Balling. **179**, 78 (1969)

Bang, J. M.
j_n Dependence of (d,p) Reactions from the Weakly Bound Projectile Model—C. A. Pearson, J. M. Bang and L. Pocs. **179**, 1082 (1969)

Barger, V.
Exchange-Degenerate A-Trajectory Interpretation of K^+p Backward Elastic Scattering Data—V. Barger. **179**, 1371 (1969)

Barker, A. A.
Radial Distribution Functions for a Hydrogenous Plasma in Equilibrium—A. A. Barker. **179**, 129 (1969)

Bartels, E. C.
Analysis of Fragmented Analog-State Resonances by Coupled Optical Equations with Effective Nonlocal Potentials—E. C. Bartels, E. R. Cosman, A. K. Kerman and J. E. Spencer. **179**, 995 (1969)

Bauminger, E. R.
Anisotropy of the Europium-Iron Exchange Interaction in Rare-Earth Iron Garnets—U. Atzmony, E. R. Bauminger, A. Mustachi, I. Nowik, S. Ofer and M. Tassa. **179**, 514 (1969)

Benedek, Giorgio
Optical Response Functions of the F Center—Giorgio Benedek and E. Mulazzi. **179**, 906 (1969)

Bennett, L. H.
Comments on Origin of Solvent Knight Shifts in Alloys—R. E. Watson, L. H. Bennett and A. J. Freemen. **179**, 590 (1969)

Copyright © 1969 by The American Physical Society

Berge, J. Peter
Production and Decay of Cascade Hyperons—Philip M. Dauber, J. Peter Berge, J. Richard Hubbard, Deane W. Merrill and Richard A. Muller. **179**, 1262 (1969)
Berger, Edmond L.
Reggeized Double-Peripheral-Model Analysis of Three-Body Final-State Processes: Application to $pp \to p\pi^-\Delta^{++}$ at 28.5 GeV/c and other Reactions—Edmond L. Berger. **179**, 1567 (1969)
Berger, S. B.
Systematics of the Hyperfine and Exchange Interactions in the Chromium Chalcogenide Spinels—S. B. Berger, J. I. Budnick and T. J. Burch. **179**, 272 (1969)
Berman, B. L.
Effect of Nuclear Polarization on the Giant Dipole Resonance of Ho^{165}—M. A. Kelly, B. L. Berman, R. L. Bramblett and S. C. Fultz. **179**, 1194 (1969)
Bessis, N.
Multiconfiguration Hartree-Fock Calculations. II. Calculation of the Lowest ^3P, ^1D, and ^1S States of the Carbon Atom—P. S. Bagus, N. Bessis and C. M. Moser. **179**, 39 (1969)
Birgeneau, R. J.
Magnetic Interactions between Rare-Earth Ions in Insulators. II. Electron-Paramagnetic-Resonance Measurements of Gd^{3+} Pair and Gd^{3+}-Eu^{3+} Interaction Constants in $EuCl_3$—R. J. Birgeneau, M. T. Hutchings and W. P. Wolf. **179**, 275 (1969)
Bjorken, J. D.
Asymptotic Sum Rules at Infinite Momentum—J. D. Bjorken. **179**, 1547 (1969)
Blackmon, Maurice L.
Regge-Pole Eikonal Theory of Small-Angle Kaon-Nucleon Scattering—Maurice L. Blackmon and Gary R. Goldstein. **179**, 1480 (1969)
Blech, I. A.
Some Anomalous Absorption Effects on the Shape of Single-Crystal Rocking Curves—I. A. Blech and E. S. Meieran. **179**, 731 (1969)
Blinc, R.
Rb^{87} Quadrupole Coupling and the Ferroelectric Transition in RbH_2AsO_4—R. Blinc and M. Mali. **179**, 552 (1969)
Blue, R. A.
Energy Straggling of Alpha Particles through Gases—J. J. Ramirez, R. M. Prior, J. B. Swint, A. R. Quinton and R. A. Blue. **179**, 310 (1969)
Blum, N. A.
Multiple Charge States, Hyperfine Interactions, and Relaxation Processes of Fe in ^{57}Co-Doped MgO—J. Chappert, R. B. Frankel, A. Misetich and N. A. Blum. **179**, 578 (1969)
Böer, K. W.
Experimental Evidence for a Reduction of the Work Function of Blocking Gold Contacts with Increasing Photocurrents in CdS—K. W. Böer, G. A. Dussel and P. Voss. **179**, 703 (1969)
Boguta, J.
Dynamical Calculations of Pseudoscalar and Axial-Vector Meson Parameters using the Relativistic Lippmann-Schwinger Equation—J. Boguta and H. W. Wyld, Jr.. **179**, 1330 (1969)
Brackmann, R. T.
Excitation of 3914 Å N_2^+ Radiation in Collisions of Heavy Ions with N_2—L. Kurzweg, H. H. Lo, R. T. Brackmann and W. L. Fite. **179**, 55 (1969)
Bramblett, R. L.
Effect of Nuclear Polarization on the Giant Dipole Resonance of Ho^{165}—M. A. Kelly, B. L. Berman, R. L. Bramblett and S. C. Fultz. **179**, 1194 (1969)
Brandenberger, J. D.
Levels of ^{69}Ga and ^{71}Ga via the $(n,n'\gamma)$ Reactions—D. E. Velkley, K. C. Chung, A. Mittler, J. D. Brandenberger and M. T. McEllistrem. **179**, 1090 (1969)
Bransden, B. H.
Identity for the Total Cross Section in an Inelastic Collision—B. H. Bransden and J. F. Reading. **179**, 982 (1969)
Branson, David
Signature of Regge Cuts Coupled to Spinning Particles—David Branson. **179**, 1608 (1969)
Breen, D. P.
Relaxation in a Jahn-Teller System. I. Copper in Octahedral Water Coordination—D. P. Breen, D. C. Krupka and F. I. B. Williams. **179**, 241 (1969)
Relaxation in a Jahn-Teller System. II—F. I. B. Williams, D. C. Krupka and D. P. Breen. **179**, 255 (1969)
Brink, Gilbert O.
g Factors of the $6s5d$ Configuration of Atomic Barium—Gilbert O. Brink and Robert J. Hull. **179**, 43 (1969)
Brouwer, W.
Surface Tension at the He^3-He^4 Interface—W. Brouwer and R. K. Pathria. **179**, 209 (1969)
Brudnoy, David M.
Old-New Model for the Nucleon Resonances—David M. Brudnoy. **179**, 1388 (1969)
Budnick, J. I.
Systematics of the Hyperfine and Exchange Interactions in the Chromium Chalcogenide Spinels—S. B. Berger, J. I. Budnick and T. J. Burch. **179**, 272 (1969)
Buluggiu, E.
Covalence Effect on the Second Moments of the ESR Absorption Curves. Case of $Na_4[Cu^{II}(NH_3)_4]\times[Cu^{I}(S_2O_3)_2]_2$—E. Buluggiu, A. Dall'olio, G. Dascola and V. Varacca. **179**, 289 (1969)
Burch, T. J.
Systematics of the Hyperfine and Exchange Interactions in the Chromium Chalcogenide Spinels—S. B. Berger, J. I. Budnick and T. J. Burch. **179**, 272 (1969)
Bushnell, D. L.
Neutron-Capture Gamma-Ray Studies of the Level Structure of the Te^{124} Nucleus—D. L. Bushnell, R. P. Chaturvedi and R. K. Smither. **179**, 1113 (1969)
Campbell, D. R.
Thermomigration and Electromigration in Zirconium—D. R. Campbell and H. B. Huntington. **179**, 601 (1969)
Cape, J. A.
Phenomenology of Shape Effects in Amperian Magnetic Systems with Application to Superconductors—J. A. Cape. **179**, 485 (1969)
Carithers, W. C., Jr.
Proton-Proton Triple Scattering at 1.9 GeV—W. C. Carithers, Jr., R. K. Adair, C. J. B. Hawkins, H. Kasha, R. C. Larsen, L. B. Leipuner, L. W. Smith and T. P. Wangler. **179**, 1304 (1969)
Carrigan, R. A., Jr.
Distribution of Charge in Th^{232} and U^{238} Determined by Measurements on Muonic X Rays—R. E. Cote, W. V. Prestwich, A. K. Gaigalas, S. Raboy, C. C. Trail, R. A. Carrigan, Jr., P. D. Gupta, R. B. Sutton, M. N. Suzuki and A. C. Thompson. **179**, 1134 (1969)
Cason, N.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Cavalleri, G.
Measurement of Lateral Diffusion Coefficients and First Townsend Coefficients for Electrons in Helium by an Electron-Density Sampling Method—G. Cavalleri. **179**, 186 (1969)
Chandler, Colston
Erratum: Causality in S-Matrix Theory [**174**, 1749 (1968)]—Colston Chandler. **179**, 1632 (1969)
Chappert, J.
Multiple Charge States, Hyperfine Interactions, and Relaxation Processes of Fe in ^{57}Co-Doped MgO—J. Chappert, R. B. Frankel, A. Misetich and N. A. Blum. **179**, 578 (1969)

Chaturvedi, R. P.
Neutron-Capture Gamma-Ray Studies of the Level Structure of the Te^{124} Nucleus—D. L. Bushnell, R. P. Chaturvedi and R. K. Smither. **179**, 1113 (1969)
Cheng, Jack C.
Magneto-Optical Stucture of the MgO *F* Band—James C. Kemp, Jack C. Cheng, Edward H. Izen and Franklin A. Modine. **179**, 818 (1969)
Chow, W. S.
Upper Critical Field of Two-Band Superconductors Containing Nonmagnetic Impurities. II—W. S. Chow. **179**, 444 (1969)
Chung, K. C.
Levels of ^{69}Ga and ^{71}Ga via the $(n,n'\gamma)$ Reactions—D. E. Velkley, K. C. Chung, A. Mittler, J. D. Brandenberger and M. T. McEllistrem. **179**, 1090 (1969)
Clark, J. W.
Excitation Functions for Radioactive Nuclides Produced by Deuteron-Induced Reactions in Iron—J. W. Clark, C. B. Fulmer and I. R. Williams. **179**, 1104 (1969)
Cohen, B. L.
Singlet Deuterons (*d*) from (*p*,*d*) Reactions—B. L. Cohen, E. C. May, T. M. O'Keefe and C. L. Fink. **179**, 962 (1969)
Collins, C. B.
Time-Dependent Behavior of the 10830 Å Line in a Low-Pressure Helium Afterglow—C. B. Collins and W. B. Hurt. **179**, 203 (1969)
Collins, M. F.
Critical and Spin-Wave Scattering of Neutrons from Iron—M. F. Collins, V. J. Minkiewicz, R. Nathans, L. Passell and G. Shirane. **179**, 417 (1969)
Collins, T. C.
Self-Consistent Orthogonalized-Plane-Wave and Empirically Refined Orthogonalized-Plane-Wave Energy-Band Models for Cubic ZnS, ZnSe, CdS, and CdSe—D. J. Stukel, R. N. Euwema, T. C. Collins, F. Herman and R. L. Kortum. **179**, 740 (1969)
Connell, John
Existence and Analyticity in *s* of the Solution to Non-Fredholm Bethe-Salpeter Equations for Scattering of Spin-½ Particles—John Connell. **179**, 1374 (1969)
Cooper, William S., III
Spectroscopic Measurement of High-Frequency Electric Fields in a Plasma by Observation of Two-Quantum Transitions and Spectral Line Shifts—William S. Cooper III and Heinz Ringler. **179**, 226 (1969)
Cosman, E. R.
Analysis of Fragmented Analog-State Resonances by Coupled Optical Equations with Effective Nonlocal Potentials—E. C. Bartels, E. R. Cosman, A. K. Kerman and J. E. Spencer. **179**, 995 (1969)
Coté, R. E.
Distribution of Charge in Th^{232} and U^{238} Determined by Measurements on Muonic X Rays—R. E. Coté, W. V. Prestwich, A. K. Gaigalas, S. Raboy, C. C. Trail, R. A. Carrigan, Jr., P. D. Gupta, R. B. Sutton, M. N. Suzuki and A. C. Thompson. **179**, 1134 (1969)
Neutron Resonances of Mo Isotopes—Hla Shwe and R. E. Coté. **179**, 1148 (1969)
Coulter, Philip W.
Generalized Potential and Bootstraps in the N/D Framework—Philip W. Coulter. **179**, 1590 (1969)
Regge Trajectories of Mesons in the Quark Model—Philip W. Coulter. **179**, 1592 (1969)
Crisp, M. D.
Radiative Effects in Semiclassical Theory—M. D. Crisp and E. T. Jaynes. **179**, 1253 (1969)
Cromer, A. H.
Proton-Proton Bremsstrahlung Calculations—J. H. McGuire, A. H. Cromer and M. I. Sobel. **179**, 948 (1969)
Čujec, B.
Energy Levels in $V^{47,49,51}$ and $Mn^{51,53,55}$ from (He^3,d) Reactions—B. Čujec and I. M. Szöghy. **179**, 1060 (1969)
Cuthbert, J. D.
Interimpurity Recombinations Involving the Isoelectronic Trap Bismuth in Gallium Phosphide—P. J. Dean, J. D. Cuthbert and R. T. Lynch. **179**, 754 (1969)
Dagan, S.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/*c* [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Dall'olio, A.
Covalence Effect on the Second Moments of the ESR Absorption Curves. Case of $Na_4[Cu^{II}(NH_3)_4]\times[Cu^{I}(S_2O_3)_2]_2$—E. Buluggiu, A. Dall'olio, G. Dascola and V. Varacca. **179**, 289 (1969)
Dascola, G.
Covalence Effect on the Second Moments of the ESR Absorption Curves. Case of $Na_4[Cu^{II}(NH_3)_4]\times[Cu^{I}(S_2O_3)_2]_2$—E. Buluggiu, A. Dall'olio, G. Dascola and V. Varacca. **179**, 289 (1969)
Datz, S.
Potential-Energy and Differential-Stopping-Power Functions from Energy-Loss Spectra of Fast Ions Channeled in Gold Single Crystals—S. Datz, C. D. Moak, T. S. Noggle, B. R. Appleton and H. O. Lutz. **179**, 315 (1969)
Dauber, Philip M.
Production and Decay of Cascade Hyperons—Philip M. Dauber, J. Peter Berge, J. Richard Hubbard, Deane W. Merrill and Richard A. Muller. **179**, 1262 (1969)
Davies, J. John
Structure of the Fluorine-Containing Trapped-Hole Center in Magnesium Oxide—William C. O'Mara, J. John Davies and John E. Wertz. **179**, 816 (1969)
Davis, R.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/*c* [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Dawes, E. L.
Computer Studies in Self-Focusing—E. L. Dawes and J. H. Marburger. **179**, 862 (1969)
Dean, P. J.
Interimpurity Recombinations Involving the Isoelectronic Trap Bismuth in Gallium Phosphide—P. J. Dean, J. D. Cuthbert and R. T. Lynch. **179**, 754 (1969)
Desai, Bipin R.
Bootstrap of ρ-P' Trajectory Using Finite-Energy Sum Rules—Bipin R. Desai, Peter E. Kaus and Yueh Shan. **179**, 1595 (1969)
Desai, P. S.
Effect of Weak Magnetism in the Semileptonic Decay of Hyperons—P. S. Desai. **179**, 1327 (1969)
de Wette, F. W.
Calculation of Dynamical Surface Properties of Noble-Gas Crystals. I. The Quasiharmonic Approximation—R. E. Allen and F. W. de Wette. **179**, 873 (1969)
Calculation of Dynamical Surface Properties of Noble-Gas Crystals. II. Molecular Dynamics—R. E. Allen, F. W. de Wette and A. Rahman. **179**, 887 (1969)
Dooher, J.
Spectral Density Sum Rules, Current Algebra, and Zero-Mass Extrapolations—J. Dooher. **179**, 1530 (1969)
Drachman, Richard J.
Addendum to "Variational Bounds in Positron-Atom Scattering"—Richard J. Drachman. **179**, 237 (1969)
Dress, W. B.
Improved Upper Limit to the Electric Dipole Moment of the Neutron—J. K. Baird, P. D. Miller, W. B. Dress and Norman F. Ramsey. **179**, 1285 (1969)

Dussel, G. A.
Experimental Evidence for a Reduction of the Work Function of Blocking Gold Contacts with Increasing Photocurrents in CdS—K. W. Böer, G. A. Dussel and P. Voss. **179**, 703 (1969)
Ebner, C.
Field Penetration in a Semi-Infinite Type-I Superconductor—C. Ebner and P. F. Milleron. **179**, 447 (1969)
Engelhardt, J. J.
Superconducting Isotope Effect in Molybdenum Boride and Tungsten Boride—J. J. Engelhardt. **179**, 452 (1969)
Engineer, Meheryar
Strong-Coupled Piezoelectric Polaron—Meheryar Engineer and George Whitfield. **179**, 869 (1969)
Erma, Victorr A.
Exact Solution for the Scattering of Electromagnetic Waves from Bodies of Arbitrary Shape. III. Obstacles with Arbitrary Electromagnetic Properties—Victorr A. Erma. **179**, 1238 (1969)
Euwema, R. N.
Self-Consistent Orthogonalized-Plane-Wave and Empirically Refined Orthogonalized-Plane-Wave Energy-Band Models for Cubic ZnS, ZnSe, CdS, and CdSe—D. J. Stukel, R. N. Euwema, T. C. Collins, F. Herman and R. L. Kortum. **179**, 740 (1969)
Fan, Chungpeng
Ising Model with Second-Neighbor Interaction. I. Some Exact Results and an Approximate Solution—Chungpeng Fan and F. Y. Wu. **179**, 560 (1969)
Ferguson, Robert L.
Charge Distribution in Fission: Fractional Cumulative Fission Yields of ^{143}Ba and ^{144}Ba from Thermal-Neutron-Induced Fission of ^{235}U—N. G. Runnalls, D. E. Troutner and Robert L. Ferguson. **179**, 1188 (1969)
Fink, C. L.
Singlet Deuterons (d) from (p,d) Reactions—B. L. Cohen, E. C. May, T. M. O'Keefe and C. L. Fink. **179**, 962 (1969)
Finnemore, D. K.
Anisotropy of the Superconducting Energy Gap in Th—J. W. Anderson, D. T. Peterson and D. K. Finnemore. **179**, 472 (1969)
Fitchen, D. B.
F Center in Cesium Fluoride: Optical Absorption Properties—T. A. Fulton and D. B. Fitchen. **179**, 846 (1969)
Fite, W. L.
Excitation of 3914 Å N_2^+ Radiation in Collisions of Heavy Ions with N_2—L. Kurzweg, H. H. Lo, R. T. Brackmann and W. L. Fite. **179**, 55 (1969)
Fitzsimmons, W. A.
Nature of Surface-Induced Nuclear-Spin Relaxation of Gaseous He^3—W. A. Fitzsimmons, L. L. Tankersley and G. K. Walters. **179**, 156 (1969)
Fletcher, N. R.
Reaction ^{12}C(^{3}He,d)^{13}N and Stripping to Unbound States—H. T. Fortune, T. J. Gray, W. Trost and N. R. Fletcher. **179**, 1033 (1969)
Flynn, C. P.
Erratum: Atomic Migration in Monatomic Crystals [**171**, 682 (1968)]—C. P. Flynn. **179**, 920 (1969)
Fortune, H. T.
Reaction ^{12}C(^{3}He,d)^{13}N and Stripping to Unbound States—H. T. Fortune, T. J. Gray, W. Trost and N. R. Fletcher. **179**, 1033 (1969)
Frankel, R. B.
Multiple Charge States, Hyperfine Interactions, and Relaxation Processes of Fe in ^{57}Co-Doped MgO—J. Chappert, R. B. Frankel, A. Misetich and N. A. Blum. **179**, 578 (1969)
Freemen, A. J.
Comments on Origin of Solvent Knight Shifts in Alloys—R. E. Watson, L. H. Bennett and A. J. Freemen. **179**, 590 (1969)
Fried, H. M.
High-Energy Nucleon Scattering and Electromagnetic Form Factors—H. M. Fried and T. K. Gaisser. **179**, 1491 (1969)
Fronsdal, C.
Compton Scattering from Bound Electrons—C. Fronsdal. **179**, 1513 (1969)
Fry, J. L.
Dielectric Function of a Model Insulator—J. L. Fry. **179**, 892 (1969)
Fulmer, C. B.
Excitation Functions for Radioactive Nuclides Produced by Deuteron-Induced Reactions in Iron—J. W. Clark, C. B. Fulmer and I. R. Williams. **179**, 1104 (1969)
Fulton, T. A.
F Center in Cesium Fluoride: Optical Absorption Properties—T. A. Fulton and D. B. Fitchen. **179**, 846 (1969)
Fultz, S. C.
Effect of Nuclear Polarization on the Giant Dipole Resonance of Ho^{165}—M. A. Kelly, B. L. Berman, R. L. Bramblett and S. C. Fultz. **179**, 1194 (1969)
Gaigalas, A. K.
Distribution of Charge in Th^{232} and U^{238} Determined by Measurements on Muonic X Rays—R. E. Cote, W. V. Prestwich, A. K. Gaigalas, S. Raboy, C. C. Trail, R. A. Carrigan, Jr., P. D. Gupta, R. B. Sutton, M. N. Suzuki and A. C. Thompson. **179**, 1134 (1969)
Gaisser, T. K.
High-Energy Nucleon Scattering and Electromagnetic Form Factors—H. M. Fried and T. K. Gaisser. **179**, 1491 (1969)
Gallagher, A.
Excitation Transfer in Nearly Adiabatic Thermal Collisions—A. Gallagher. **179**, 105 (1969)
Gallmann, A.
Beta Decays of C^{15}, F^{17}, and F^{20}—A. Gallmann, F. Jundt, E. Aslanides and D. E. Alburger. **179**, 921 (1969)
Garcia, J. D.
Ionization of Positive Ions—Brian K. Thomas and J. D. Garcia. **179**, 94 (1969)
Gatti, R. C.
Electron- and Bremsstrahlung-Induced Fission of Heavy and Medium-Heavy Nuclei—L. G. Moretto, R. C. Gatti, S. G. Thompson, J. T. Routti, J. H. Heisenberg, L. M. Middleman, M. R. Yearian and R. Hofstadter. **179**, 1176 (1969)
Gatto, R.
Anomalous Magnetic Moments of Nucleons and Sidewise Dispersion Relations—M. Ademollo, R. Gatto and G. Longhi. **179**, 1601 (1969)
Gaunt, David S.
Exact Series-Expansion Study of the Monomer-Dimer Problem —David S. Gaunt. **179**, 174 (1969)
Gautam, V. P.
Mass-Shell Evaluation of the Amplitude, Partial Conservation of Axial-Vector Current, and Equal-Time Commutators in Low-Energy $K^{\pm}p$ Scattering—A. A. Golestaneh and V. P. Gautam. **179**, 1449 (1969)
Gell-Mann, Murray
Amelioration of Divergence Difficulties in the Theory of Weak Interactions—Murray Gell-Mann, Marvin L. Goldberger, Norman M. Kroll and Francis E. Low. **179**, 1518 (1969)
George, David J.
$O(3,1)$ Symmetry and Conspiracy in the Reaction $\pi+N\rightarrow\rho+\Delta$ at High Energy—David J. George and L. M. Nath. **179**, 1382 (1969)
Gerardo, J. B.
Properties of an Afterglow Helium Plasma—J. W. Poukey, J. B. Gerardo and M. A. Gusinow. **179**, 211 (1969)
Gersten, Joel I.
Theory of Dipole Moments Induced Between Well-Separated Atoms—Joel I. Gersten. **179**, 1 (1969)
Ginsberg, D. M.
Erratum: Thermal Conductivity of Superconducting Tin Films in a Magnetic Field [**167**, 345 (1968)]—John E. Smith, Jr. and D. M. Ginsberg. **179**, 592 (1969)

Girifalco, L. A.
Wannier Representation of Energy in Metals—L. A. Girifalco. **179**, 616 (1969)
Giura, M.
Singularities on the Fermi Surface of Bismuth—M. Giura, R. Marcon, T. Papa and F. Wanderlingh. **179**, 645 (1969)
Goldberger, Marvin L.
Amelioration of Divergence Difficulties in the Theory of Weak Interactions—Murray Gell-Mann, Marvin L. Goldberger, Norman M. Kroll and Francis E. Low. **179**, 1518 (1969)
Goldman, L. H.
Nuclear Structure in Cd^{113} from the $Cd^{112}(d,p)$ Reaction—L. H. Goldman, J. Kremenek and S. Hinds. **179**, 1172 (1969)
Goldstein, Gary R.
Model for Low-Energy Meson-Baryon Scattering—Gary R. Goldstein. **179**, 1457 (1969)
Regge-Pole Eikonal Theory of Small-Angle Kaon-Nucleon Scattering—Maurice L. Blackmon and Gary R. Goldstein. **179**, 1480 (1969)
Goldwasser, E. L.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Golestaneh, A. A.
Mass-Shell Evaluation of the Amplitude, Partial Conservation of Axial-Vector Current, and Equal-Time Commutators in Low-Energy $K^{\pm}p$ Scattering—A. A. Golestaneh and V. P. Gautam. **179**, 1449 (1969)
Good, M. L.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Good, R. H., Jr.
Spin-One Particle in an External Electromagnetic Field—D. Shay and R. H. Good, Jr.. **179**, 1410 (1969)
Description of Massless Particles—T. J. Nelson and R. H. Good, Jr.. **179**, 1445 (1969)
Gordon, J. P.
Photon Echoes in Gases—J. P. Gordon, C. H. Wang, C. K. N. Patel, R. E. Slusher and W. J. Tomlinson. **179**, 294 (1969)
Gray, T. J.
Reaction $^{12}C(^3He,d)^{13}N$ and Stripping to Unbound States—H. T. Fortune, T. J. Gray, W. Trost and N. R. Fletcher. **179**, 1033 (1969)
Greenberg, David F.
Current Algebra on the Mass Shell: Leptonic K Decays. II—David F. Greenberg. **179**, 1623 (1969)
Greenberg, O. W.
Consequences of $SU(3)''$ Excitation in Baryon Resonances—O. W. Greenberg and C. A. Nelson. **179**, 1354 (1969)
Gross, David J.
Theory of Currents and Nonstrong Interactions—David J. Gross and M. B. Halpern. **179**, 1436 (1969)
Gupta, P. D.
Distribution of Charge in Th^{232} and U^{238} Determined by Measurements on Muonic X Rays—R. E. Cote, W. V. Prestwich, A. K. Gaigalas, S. Raboy, C. C. Trail, R. A. Carrigan, Jr., P. D. Gupta, R. B. Sutton, M. N. Suzuki and A. C. Thompson. **179**, 1134 (1969)
Gusinow, M. A.
Properties of an Afterglow Helium Plasma—J. W. Poukey, J. B. Gerardo and M. A. Gusinow. **179**, 211 (1969)
Halbert, M. L.
Proton-Proton Bremsstrahlung at 65 MeV—D. L. Mason, M. L. Halbert, A. van der Woude and L. C. Northcliffe. **179**, 940 (1969)
Halpern, M. B.
Theory of Currents and Nonstrong Interactions—David J. Gross and M. B. Halpern. **179**, 1436 (1969)
Hameed, S.
Difficulties of the Independent-Particle Model in the Description of Energetic Transitions in Atoms—S. Hameed. **179**, 16 (1969)
Hamilton, J. H.
β- and γ-Vibrational Bands of ^{152}Sm and ^{154}Gd—L. L. Riedinger, Noah R. Johnson and J. H. Hamilton. **179**, 1214 (1969)
Hardy, J. R.
Lattice Dynamics and Second-Order Raman Spectrum of NaF—J. R. Hardy, A. M. Karo, I. W. Morrison, C. T. Sennett and J. P. Russell. **179**, 837 (1969)
Hart, R. R.
Oxygen K-Shell X-Ray Production in Thin Films of Aluminum Oxide by 20- to 100-keV Protons—R. R. Hart, F. William Reuter, III, Harold P. Smith, Jr. and J. M. Khan. **179**, 4 (1969)
Hartung, R.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Hawkins, C. J. B.
Proton-Proton Triple Scattering at 1.9 GeV—W. C. Carithers, Jr., R. K. Adair, C. J. B. Hawkins, H. Kasha, R. C. Larsen, L. B. Leipuner, L. W. Smith and T. P. Wangler. **179**, 1304 (1969)
Hein, R. A.
Critical Magnetic Fields of Superconducting SnTe—R. A. Hein and P. H. E. Meijer. **179**, 497 (1969)
Heinrichs, Jean
Theory of the Dielectric Constant in the Individual-Ion Model of Ionic and Rare-Gas Crystals—Jean Heinrichs. **179**, 823 (1969)
Heisenberg, J. H.
Electron- and Bremsstrahlung-Induced Fission of Heavy and Medium-Heavy Nuclei—L. G. Moretto, R. C. Gatti, S. G. Thompson, J. T. Routti, J. H. Heisenberg, L. M. Middleman, M. R. Yearian and R. Hofstadter. **179**, 1176 (1969)
Herman, F.
Self-Consistent Orthogonalized-Plane-Wave and Empirically Refined Orthogonalized-Plane-Wave Energy-Band Models for Cubic ZnS, ZnSe, CdS, and CdSe—D. J. Stukel, R. N. Euwema, T. C. Collins, F. Herman and R. L. Kortum. **179**, 740 (1969)
Hinds, S.
Nuclear Structure in Cd^{113} from the $Cd^{112}(d,p)$ Reaction—L. H. Goldman, J. Kremenek and S. Hinds. **179**, 1172 (1969)
Hofstadter, R.
Electron- and Bremsstrahlung-Induced Fission of Heavy and Medium-Heavy Nuclei—L. G. Moretto, R. C. Gatti, S. G. Thompson, J. T. Routti, J. H. Heisenberg, L. M. Middleman, M. R. Yearian and R. Hofstadter. **179**, 1176 (1969)
Hopf, Frederic A.
Theory of an Inhomogeneously Broadened Laser Amplifier—Frederic A. Hopf and Marlan O. Scully. **179**, 399 (1969)
Hubbard, J. Richard
Production and Decay of Cascade Hyperons—Philip M. Dauber, J. Peter Berge, J. Richard Hubbard, Deane W. Merrill and Richard A. Muller. **179**, 1262 (1969)
Hull, Robert J.
g Factors of the $6s5d$ Configuration of Atomic Barium—Gilbert O. Brink and Robert J. Hull. **179**, 43 (1969)
Huntington, H. B.
Thermomigration and Electromigration in Zirconium—D. R. Campbell and H. B. Huntington. **179**, 601 (1969)
Hurault, J. P.
Nonlinear Effects on the Conductivity of a Superconductor above Its Transition Temperature—J. P. Hurault. **179**, 494 (1969)

Hurt, W. B.
Time-Dependent Behavior of the 10830 Å Line in a Low-Pressure Helium Afterglow—C. B. Collins and W. B. Hurt. **179**, 203 (1969)
Hutchings, M. T.
Magnetic Interactions between Rare-Earth Ions in Insulators. II. Electron-Paramagnetic-Resonance Measurements of Gd^{3+} Pair and Gd^{3+}-Eu^{3+} Interaction Constags in $EuCl_3$—R. J. Birgeneau, M. T. Hutchings and W. P. Wolf. **179**, 275 (1969)
Izen, Edward H.
Magneto-Optical Stucture of the MgO *F* Band—James C. Kemp, Jack C. Cheng, Edward H. Izen and Franklin A. Modine. **179**, 818 (1969)
James, P. B.
Dip Cancellation by an Interference Phenomenon—P. B. James. **179**, 1559 (1969)
Jaynes, E. T.
Radiative Effects in Semiclassical Theory—M. D. Crisp and E. T. Jaynes. **179**, 1253 (1969)
Jha, Sudhanshu S.
Spin-Flip Raman Scattering by Carriers in PbTe, PbSe, and PbS—Sudhanshu S. Jha. **179**, 764 (1969)
Johnson, Noah R.
β- and γ-Vibrational Bands of ^{152}Sm and ^{154}Gd—L. L. Riedinger, Noah R. Johnson and J. H. Hamilton. **179**, 1214 (1969)
Jones, B. K.
Strain-Dependent Magnetoresistance of Sodium and Potassium—B. K. Jones. **179**, 637 (1969)
Jones, C. M.
Level Structure in ^{15}O from the Proton Bombardment of ^{14}N—M. L. West, C. M. Jones, J. K. Bair and H. B. Willard. **179**, 1047 (1969)
Jones, Lorella M.
Behavior of Helicity Amplitudes at a Threshold Involving One Photon—Lorella M. Jones. **179**, 1627 (1969)
Joyce, R. R.
Far-Infrared Spectra of Al_2O_3 Doped with Ti, V, and Cr—R. R. Joyce and P. L. Richards. **179**, 375 (1969)
Jundt, F.
Beta Decays of C^{15}, F^{17}, and F^{20}—A. Gallmann, F. Jundt, E. Aslanides and D. E. Alburger. **179**, 921 (1969)
Kang, Ik-Ju
Asymptotic Form of the Total Wave Function for Electron-Impact Excitation of Hydrogen Atoms—Ik-Ju Kang. **179**, 101 (1969)
Karo, A. M.
Lattice Dynamics and Second-Order Raman Spectrum of NaF—J. R. Hardy, A. M. Karo, I. W. Morrison, C. T. Sennett and J. P. Russell. **179**, 837 (1969)
Kasha, H.
Proton-Proton Triple Scattering at 1.9 GeV—W. C. Carithers, Jr., R. K. Adair, C. J. B. Hawkins, H. Kasha, R. C. Larsen, L. B. Leipuner, L. W. Smith and T. P. Wangler. **179**, 1304 (1969)
Kaus, Peter E.
Bootstrap of ρ-P' Trajectory Using Finite-Energy Sum Rules—Bipin R. Desai, Peter E. Kaus and Yueh Shan. **179**, 1595 (1969)
Kelly, M. A.
Effect of Nuclear Polarization on the Giant Dipole Resonance of Ho^{165}—M. A. Kelly, B. L. Berman, R. L. Bramblett and S. C. Fultz. **179**, 1194 (1969)
Kemp, James C.
Magneto-Optical Stucture of the MgO *F* Band—James C. Kemp, Jack C. Cheng, Edward H. Izen and Franklin A. Modine. **179**, 818 (1969)
Kenny, Brian G.
Charge Asymmetry in $K_2^0 \to \pi^\pm l^\mp \nu$—Brian G. Kenny. **179**, 1617 (1969)
Kerman, A. K.
Analysis of Fragmented Analog-State Resonances by Coupled Optical Equations with Effective Nonlocal Potentials—E. C. Bartels, E. R. Cosman, A. K. Kerman and J. E. Spencer. **179**, 995 (1969)
Khan, J. M.
Oxygen *K*-Shell X-Ray Production in Thin Films of Aluminum Oxide by 20- to 100-keV Protons—R. R. Hart, F. William Reuter, III, Harold P. Smith, Jr. and J. M. Khan. **179**, 4 (1969)
Kijewski, L. J.
Pauli-Principle Restriction on the Two-Matrix of Bopp for Atomic Ground States—L. J. Kijewski and J. K. Percus. **179**, 45 (1969)
Klein, Miles V.
Thermal Conductivity of Doped and Pure Cadmium Sulfide—Glenn E. Moore, Jr. and Miles V. Klein. **179**, 722 (1969)
Knasel, T. M.
Erratum: Incoherent-Scattering Function, Total Pair-Production Cross Section, and Pair-Production Length for Helium [**171**, 1643 (1968)]—T. M. Knasel. **179**, 1632 (1969)
Kofler, R.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Konecny, E.
Erratum: Fission Energetics and Neutron Emission in 13-MeV Proton-Induced Fission of ^{226}Ra [**172**, 1213 (1968)]—E. Konecny and H. W. Schmitt. **179**, 1232 (1969)
Kortum, R. L.
Self-Consistent Orthogonalized-Plane-Wave and Empirically Refined Orthogonalized-Plane-Wave Energy-Band Models for Cubic ZnS, ZnSe, CdS, and CdSe—D. J. Stukel, R. N. Euwema, T. C. Collins, F. Herman and R. L. Kortum. **179**, 740 (1969)
Kramer, Lorenz
Thermodynamic Stability of Superfluid Flow Through A Channel—Lorenz Kramer. **179**, 149 (1969)
Krauss, R.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Kremenek, J.
Nuclear Structure in Cd^{113} from the $Cd^{112}(d,p)$ Reaction—L. H. Goldman, J. Kremenek and S. Hinds. **179**, 1172 (1969)
Kroll, Norman M.
Amelioration of Divergence Difficulties in the Theory of Weak Interactions—Murray Gell-Mann, Marvin L. Goldberger, Norman M. Kroll and Francis E. Low. **179**, 1518 (1969)
Kropac, W.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Krupka, D. C.
Relaxation in a Jahn-Teller System. I. Copper in Octahedral Water Coordination—D. P. Breen, D. C. Krupka and F. I. B. Williams. **179**, 241 (1969)
Relaxation in a Jahn-Teller System. II—F. I. B. Williams, D. C. Krupka and D. P. Breen. **179**, 255 (1969)
Kruse, U. E.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)

Kulcinski, G. L.
Effect of Hydrostatic Pressure on the Recovery of Electrical Properties of Neutron-Irradiated Molybdenum—G. L. Kulcinski. **179**, 676 (1969)
Kurzweg, L.
Excitation of 3914 Å N_2^+ Radiation in Collisions of Heavy Ions with N_2—L. Kurzweg, H. H. Lo, R. T. Brackmann and W. L. Fite. **179**, 55 (1969)
Kusch, P.
Interaction between a Neutral Atomic or Molecular Beam and a Conducting Surface—D. Raskin and P. Kusch. **179**, 712 (1969)
Lakin, W. L.
Energy Loss and Straggling in Silicon by High-Energy Electrons, Positive Pions, and Protons—D. W. Aitken, W. L. Lakin and H. R. Zulliger. **179**, 393 (1969)
Lamb, Willis E., Jr.
Quantum Theory of an Optical Maser. III. Theory of Photoelectron Counting Statistics—Marlan O. Scully and Willis E. Lamb, Jr.. **179**, 368 (1969)
Lange, James N.
Low-Frequency Magnetoacoustic Effects in Elastic Solids—James N. Lange. **179**, 631 (1969)
Microwave Acoustic Relaxation in Reduced Rutile—James N. Lange. **179**, 860 (1969)
Lapeyre, Gerald J.
Photoemission Investigation of the Electronic Structure of Dysprosium—Gerald J. Lapeyre. **179**, 623 (1969)
Lapp, M.
Bound States of Alkali and Nobel-Gas Atoms—G. D. Mahan and M. Lapp. **179**, 19 (1969)
Larsen, R. C.
Proton-Proton Triple Scattering at 1.9 GeV—W. C. Carithers, Jr., R. K. Adair, C. J. B. Hawkins, H. Kasha, R. C. Larsen, L. B. Leipuner, L. W. Smith and T. P. Wangler. **179**, 1304 (1969)
Lasinski, T.
Momentum Dependence of Diffraction Slopes in Meson-Nucleon Scattering—T. Lasinski, R. Levi Setti and E. Predazzi. **179**, 1426 (1969)
Lawrence, George M.
Lifetimes of Cascade-Free Transitions in Ions of Ar, Cl, and S—George M. Lawrence. **179**, 134 (1969)
Lee, Y. Y.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Leipuner, L. B.
Proton-Proton Triple Scattering at 1.9 GeV—W. C. Carithers, Jr., R. K. Adair, C. J. B. Hawkins, H. Kasha, R. C. Larsen, L. B. Leipuner, L. W. Smith and T. P. Wangler. **179**, 1304 (1969)
Levers, R. G.
Current-Algebra-Constrained Single-Pole Approximation to the S-Wave π-π Phase Shifts—R. G. Levers. **179**, 1528 (1969)
Levey, R. P.
Solid-State and Nuclear Results from a Measurement of the Pressure Dependence of the Energy of the Resonance Gamma Ray of ^{197}Au—Louis D. Roberts, D. O. Patterson, J. O. Thomson and R. P. Levey. **179**, 656 (1969)
Levinger, J. S.
Separable Approximations to the t Matrix—J. S. Levinger, A. H. Lu and R. Stagat. **179**, 926 (1969)
Lipinski, H. M.
$O(4)$ Expansion of the Bethe-Salpeter Equation for $\pi\rho$ Scattering—H. M. Lipinski and D. R. Snider. **179**, 1315 (1969)
Lo, H. H.
Excitation of 3914 Å N_2^+ Radiation in Collisions of Heavy Ions with N_2—L. Kurzweg, H. H. Lo, R. T. Brackmann and W. L. Fite. **179**, 55 (1969)
Longhi, G.
Anomalous Magnetic Moments of Nucleons and Sidewise Dispersion Relations—M. Ademollo, R. Gatto and G. Longhi. **179**, 1601 (1969)
Loos, J.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Low, Francis E.
Amelioration of Divergence Difficulties in the Theory of Weak Interactions—Murray Gell-Mann, Marvin L. Goldberger, Norman M. Kroll and Francis E. Low. **179**, 1518 (1969)
Lu, A. H.
Separable Approximations to the t Matrix—J. S. Levinger, A. H. Lu and R. Stagat. **179**, 926 (1969)
Lutz, H. O.
Potential-Energy and Differential-Stopping-Power Functions from Energy-Loss Spectra of Fast Ions Channeled in Gold Single Crystals—S. Datz, C. D. Moak, T. S. Noggle, B. R. Appleton and H. O. Lutz. **179**, 315 (1969)
Lynch, R. T.
Interimpurity Recombinations Involving the Isoelectronic Trap Bismuth in Gallium Phosphide—P. J. Dean, J. D. Cuthbert and R. T. Lynch. **179**, 754 (1969)
Macfarlane, R. M.
Magnetic Davydov Splittings in the Optical Absorption Spectrum of Cr_2O_3—J. W. Allen, R. M. Macfarlane and R. L. White. **179**, 523 (1969)
MacGregor, Malcolm H.
Phase-Shift Analysis of High-Precision (p,p) Differential Cross-Section Data at 6.141, 8.097, and 9.918 MeV—Malcolm H. MacGregor, Richard A. Arndt and Robert M. Wright. **179**, 1624 (1969)
MacKenzie, James J.
Corrections to the Hartree-Fock Approximation for Homogeneous Nuclear Matter—James J. MacKenzie. **179**, 1002 (1969)
Mahan, G. D.
Bound States of Alkali and Noble-Gas Atoms—G. D. Mahan and M. Lapp. 179, 19 (1969)
Mali, M.
Rb^{87} Quadrupole Coupling and the Ferroelectric Transition in RbH_2AsO_4—R. Blinc and M. Mali. **179**, 552 (1969)
Manuel, O. K.
Xenon and Krypton from the Spontaneous Fission of Californium-252—B. Srinivasan, E. C. Alexander, Jr., O. K. Manuel and D. E. Troutner. **179**, 1166 (1969)
Marburger, J. H.
Computer Studies in Self-Focusing—E. L. Dawes and J. H. Marburger. **179**, 862 (1969)
Marcon, R.
Singularities on the Fermi Surface of Bismuth—M. Giura, R. Marcon, T. Papa and F. Wanderlingh. **179**, 645 (1969)
Marmer, G. J.
Differential Production Cross Sections of Low-Momentum Particles from 12.3-BeV/c Protons on Beryllium and Copper—G. J. Marmer, K. Reibel, D. M. Schwartz, A. Stevens, R. Winston, D. Wolfe, C. J. Rush, P. R. Phillips, E. C. Swallow and T. A. Romanowski. **179**, 1294 (1969)
Mason, D. L.
Proton-Proton Bremsstrahlung at 65 MeV—D. L. Mason, M. L. Halbert, A. van der Woude and L. C. Northcliffe. **179**, 940 (1969)
Matsuda, S.
Intermultiplet Mass Formulas for Octet Bosons and the Splitting of the $K^{**}(1420)$—S. Matsuda and S. Oneda. **179**, 1301 (1969)
May, E. C.
Singlet Deuterons (d) from (p,d) Reactions—B. L. Cohen, E. C. May, T. M. O'Keefe and C. L. Fink. **179**, 962 (1969)

McBride, John B.
Relativistic Corrections to the Conductivity of a Collisional Plasma in a Magnetic Field—John B. McBride and Agnar Pytte. **179**, 145 (1969)
McEllistrem, M. T.
Levels of ^{69}Ga and ^{71}Ga via the $(n,n'\gamma)$ Reactions—D. E. Velkley, K. C. Chung, A. Mittler, J. D. Brandenberger and M. T. McEllistrem. **179**, 1090 (1969)
McGuire, J. H.
Proton-Proton Bremsstrahlung Calculations—J. H. McGuire, A. H. Cromer and M. I. Sobel. **179**, 948 (1969)
McIntyre, J. A.
Spins and Widths of Energy Levels in the 5–9-MeV Region—S. Ramchandran and J. A. McIntyre. **179**, 1153 (1969)
Meieran, E. S.
Some Anomalous Absorption Effects on the Shape of Single-Crystal Rocking Curves—I. A. Blech and E. S. Meieran. **179**, 731 (1969)
Meijer, P. H. E.
Critical Magnetic Fields of Superconducting SnTe—R. A. Hein and P. H. E. Meijer. **179**, 497 (1969)
Meincke, P. P. M.
Measurement of the Elastic Constants and Search for Collective Oscillations of the Vortex Lattice in a Type-II Superconductor (Niobium)—P. P. M. Meincke and W. A. Reed. **179**, 463 (1969)
Merideth, Charles W.
Use of the Relaxation Function in the Nuclear Magnetic Resonance Analysis of Internal Motions in Solids—Edwin M. Roberts and Charles W. Merideth. **179**, 381 (1969)
Merrill, Deane W.
Production and Decay of Cascade Hyperons—Philip M. Dauber, J. Peter Berge, J. Richard Hubbard, Deane W. Merrill and Richard A. Muller. **179**, 1262 (1969)
Middleman, L. M.
Electron- and Bremsstrahlung-Induced Fission of Heavy and Medium-Heavy Nuclei—L. G. Moretto, R. C. Gatti, S. G. Thompson, J. T. Routti, J. H. Heisenberg, L. M. Middleman, M. R. Yearian and R. Hofstadter. **179**, 1176 (1969)
Mikeska, H. J.
Critical Heat Flux in Liquid Helium II Close to the λ Transition—H. J. Mikeska. **179**, 166 (1969)
Miller, P. D.
Improved Upper Limit to the Electric Dipole Moment of the Neutron—J. K. Baird, P. D. Miller, W. B. Dress and Norman F. Ramsey. **179**, 1285 (1969)
Milleron, P. F.
Field Penetration in a Semi-Infinite Type-I Superconductor—C. Ebner and P. F. Milleron. **179**, 447 (1969)
Minkiewicz, V. J.
Critical and Spin-Wave Scattering of Neutrons from Iron—M. F. Collins, V. J. Minkiewicz, R. Nathans, L. Passell and G. Shirane. **179**, 417 (1969)
Misetich, A.
Multiple Charge States, Hyperfine Interactions, and Relaxation Processes of Fe in ^{57}Co-Doped MgO—J. Chappert, R. B. Frankel, A. Misetich and N. A. Blum. **179**, 578 (1969)
Mittler, A.
Levels of ^{69}Ga and ^{71}Ga via the $(n,n'\gamma)$ Reactions—D. E. Velkley, K. C. Chung, A. Mittler, J. D. Brandenberger and M. T. McEllistrem. **179**, 1090 (1969)
Moak, C. D.
Potential-Energy and Differential-Stopping-Power Functions from Energy-Loss Spectra of Fast Ions Channeled in Gold Single Crystals—S. Datz, C. D. Moak, T. S. Noggle, B. R. Appleton and H. O. Lutz. **179**, 315 (1969)
Mock, Willis, Jr.
Thermomigration of Au^{195} and Sb^{125} in Gold—Willis Mock, Jr. **179**, 663 (1969)
Modine, Franklin A.
Magneto-Optical Stucture of the MgO *F* Band—James C. Kemp, Jack C. Cheng, Edward H. Izen and Franklin A. Modine. **179**, 818 (1969)
Moen, I. O.
Structure and Solutions of a Unified Theory of Gravitation and Symmetry Violation—I. O. Moen and J. W. Moffat. **179**, 1233 (1969)
Moffat, J. W.
Structure and Solutions of a Unified Theory of Gravitation and Symmetry Violation—I. O. Moen and J. W. Moffat. **179**, 1233 (1969)
Mohapatra, R. N.
Leading Divergences in Nonleptonic Decays—R. N. Mohapatra and P. Olesen. **179**, 1417 (1969)
Moinester, M.
Multipole Analysis of Particle-Particle or Particle-Hole Multiplets—M. Moinester, J. P. Schiffer and W. P. Alford. **179**, 984 (1969)
Moore, Glenn E., Jr.
Thermal Conductivity of Doped and Pure Cadmium Sulfide—Glenn E. Moore, Jr. and Miles V. Klein. **179**, 722 (1969)
Morabito, J. M., Jr.
Studies of the Mean Displacement of Surface Atoms in the (100) and (110) Faces of Silver Single Crystals at Low Temperatures—J. M. Morabito, Jr., R. F. Steiger and G. A. Somorjai. **179**, 638 (1969)
Moretto, L. G.
Electron- and Bremsstrahlung-Induced Fission of Heavy and Medium-Heavy Nuclei—L. G. Moretto, R. C. Gatti, S. G. Thompson, J. T. Routti, J. H. Heisenberg, L. M. Middleman, M. R. Yearian and R. Hofstadter. **179**, 1176 (1969)
Morrison, I. W.
Lattice Dynamics and Second-Order Raman Spectrum of NaF—J. R. Hardy, A. M. Karo, I. W. Morrison, C. T. Sennett and J. P. Russell. **179**, 837 (1969)
Moser, C. M.
Multiconfiguration Hartree-Fock Calculations. II. Calculation of the Lowest ^3P, ^1D, and ^1S States of the Carbon Atom—P. S. Bagus, N. Bessis and C. M. Moser. **179**, 39 (1969)
Mott, J.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/*c* [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Mulazzi, E.
Optical Response Functions of the *F* Center—Giorgio Benedek and E. Mulazzi. **179**, 906 (1969)
Muller, Richard A.
Production and Decay of Cascade Hyperons—Philip M. Dauber, J. Peter Berge, J. Richard Hubbard, Deane W. Merrill and Richard A. Muller. **179**, 1262 (1969)
Mustachi, A.
Anisotropy of the Europium-Iron Exchange Interaction in Rare-Earth Iron Garnets—U. Atzmony, E. R. Bauminger, A. Mustachi, I. Nowik, S. Ofer and M. Tassa. **179**, 514 (1969)
Nagarajan, M. A.
Use of the *K* Matrix in Nuclear Reaction Theories—W. Tobocman and M. A. Nagarajan. **179**, 1230 (1969)
Narath, Albert
Nuclear Magnetic Resonance in Hexagonal Lanthanum Metal: Knight Shifts, Spin Relaxation Rates, and Quadrupole Coupling Constants—Albert Narath. **179**, 359 (1969)
Nath, L. M.
$O(3,1)$ Symmetry and Conspiracy in the Reaction $\pi+N\rightarrow\rho+\Delta$ at High Energy—David J. George and L. M. Nath. **179**, 1382 (1969)
Nathans, R.
Critical and Spin-Wave Scattering of Neutrons from Iron—M. F. Collins, V. J. Minkiewicz, R. Nathans, L. Passell and G. Shirane. **179**, 417 (1969)
Nelson, C. A.
Consequences of $SU(3)''$ Excitation in Baryon Resonances—O W. Greenberg and C. A. Nelson. **179**, 1354 (1969)

Nelson, T. J.
Description of Massless Particles—T. J. Nelson and R. H. Good, Jr.. **179**, 1445 (1969)
Nesbet, R. K.
Anomaly-Free Variational Method for Inelastic Scattering—R. K. Nesbet. **179**, 60 (1969)
Noggle, T. S.
Potential-Energy and Differential-Stopping-Power Functions from Energy-Loss Spectra of Fast Ions Channeled in Gold Single Crystals—S. Datz, C. D. Moak, T. S. Noggle, B. R. Appleton and H. O. Lutz. **179**, 315 (1969)
Northcliffe, L. C.
Proton-Proton Bremsstrahlung at 65 MeV—D. L. Mason, M. L. Halbert, A. van der Woude and L. C. Northcliffe. **179**, 940 (1969)
Nowik, I.
Anisotropy of the Europium-Iron Exchange Interaction in Rare-Earth Iron Garnets—U. Atzmony, E. R. Bauminger, A. Mustachi, I. Nowik, S. Ofer and M. Tassa. **179**, 514 (1969)
O'Brien, M. W.
Direct-Transition Optical Absorption in PbS, PbSe, and PbTe from Relativistic Augmented-Plane-Wave Functions—P. T. Bailey, M. W. O'Brien and S. Rabii. **179**, 735 (1969)
Ofer, S.
Anisotropy of the Europium-Iron Exchange Interaction in Rare-Earth Iron Garnets—U. Atzmony, E. R. Bauminger, A. Mustachi, I. Nowik, S. Ofer and M. Tassa. **179**, 514 (1969)
Ohnuma, H.
Study of the $Zr^{94}(He^3,d)Nb^{95}$ Reaction—H. Ohnuma and J. L. Yntema. **179**, 1211 (1969)
O'Keefe, T. M.
Singlet Deuterons (d) from (p,d) Reactions—B. L. Cohen, E. C. May, T. M. O'Keefe and C. L. Fink. **179**, 962 (1969)
Okubo, S.
Sign and Model Dependence of $\pi^0 \to 2\gamma$ Matrix Element—S. Okubo. **179**, 1629 (1969)
Olesen, P.
Leading Divergences in Nonleptonic Decays—R. N. Mohapatra and P. Olesen. **179**, 1417 (1969)
Olin, Arthur
Influence of Superconductivity on the Half-Life of Niobium-90^m—Arthur Olin and Kenneth T. Bainbridge. **179**, 450 (1969)
O'Mara, William C.
Structure of the Fluorine-Containing Trapped-Hole Center in Magnesium Oxide—William C. O'Mara, J. John Davies and John E. Wertz. **179**, 816 (1969)
Oneda, S.
Intermultiplet Mass Formulas for Octet Bosons and the Splitting of the $K^{**}(1420)$—S. Matsuda and S. Oneda. **179**, 1301 (1969)
Öpik, U.
Point Defects in Ionic Crystals. I. Methods of Calculating the Electronic Structure—U. Öpik and R. F. Wood. **179**, 772 (1969)
Point Defects in Ionic Crystals. II. The F Center in KCl, KBr, KI, and NaCl—R. F. Wood and U. Öpik. **179**, 783 (1969)
Orbach, R.
Dynamics of Localized Moments in Metals. I. Kubo Formalism and Relaxation—H. J. Spencer and R. Orbach. **179**, 683 (1969)
Dynamics of Localized Moments in Metals. II. Second-Order Exchange Effects—R. Orbach and H. J. Spencer. **179**, 690 (1969)
Pagels, Heinz
Hadronic Corrections to the Goldberger-Treiman Relation—Heinz Pagels. **179**, 1337 (1969)
Papa, T.
Singularities on the Fermi Surface of Bismuth—M. Giura, R. Marcon, T. Papa and F. Wanderlingh. **179**, 645 (1969)
Passell, L.
Critical and Spin-Wave Scattering of Neutrons from Iron—M. F. Collins, V. J. Minkiewicz, R. Nathans, L. Passell and G. Shirane. **179**, 417 (1969)
Patel, C. K. N.
Photon Echoes in Gases—J. P. Gordon, C. H. Wang, C. K. N. Patel, R. E. Slusher and W. J. Tomlinson. **179**, 294 (1969)
Pathria, R. K.
Surface Tension at the He^3-He^4 Interface—W. Brouwer and R. K. Pathria. **179**, 209 (1969)
Patil, Sharashchandra H.
s-Wave Scattering Lengths, $\pi\pi$ Dynamics, and a Universal Partial Width for a Regge Trajectory—Sharashchandra H. Patil. **179**, 1405 (1969)
Patterson, D. O.
Solid-State and Nuclear Results from a Measurement of the Pressure Dependence of the Energy of the Resonance Gamma Ray of ^{197}Au—Louis D. Roberts, D. O. Patterson, J. O. Thomson and R. P. Levey. **179**, 656 (1969)
Patton, Carl E.
Effective Linewidth due to Porosity and Anisotropy in Polycrystalline Yttrium Iron Garnet and Ca-V-Substituted Yttrium Iron Garnet at 10 GHz—Carl E. Patton. **179**, 352 (1969)
Payne, G.
Compact Operators and Particle-Bound-State Scattering: One Channel Case—G. Payne. **179**, 85 (1969)
Pearson, C. A.
j_n Dependence of (d,p) Reactions from the Weakly Bound Projectile Model—C. A. Pearson, J. M. Bang and L. Pocs. **179**, 1082 (1969)
Percus, J. K.
Pauli-Principle Restriction on the Two-Matrix of Bopp for Atomic Ground States—L. J. Kijewski and J. K. Percus. **179**, 45 (1969)
Peterson, D. T.
Anisotropy of the Superconducting Energy Gap in Th—J. W. Anderson, D. T. Peterson and D. K. Finnemore. **179**, 472 (1969)
Phillips, P. R.
Differential Production Cross Sections of Low-Momentum Particles from 12.3-BeV/c Protons on Beryllium and Copper—G. J. Marmer, K. Reibel, D. M. Schwartz, A. Stevens, R. Winston, D. Wolfe, C. J. Rush, P. R. Phillips, E. C. Swallow and T. A. Romanowski. **179**, 1294 (1969)
Phillips, R. E.
π^+ Decay of $_\Lambda He^4$—R. E. Phillips and J. Schneps. **179**, 1292 (1969)
Pocs, L.
j_n Dependence of (d,p) Reactions from the Weakly Bound Projectile Model—C. A. Pearson, J. M. Bang and L. Pocs. **179**, 1082 (1969)
Poukey, J. W.
Properties of an Afterglow Helium Plasma—J. W. Poukey, J. B. Gerardo and M. A. Gusinow. **179**, 211 (1969)
Predazzi, E.
Momentum Dependence of Diffraction Slopes in Meson-Nucleon Scattering—T. Lasinski, R. Levi Setti and E. Predazzi. **179**, 1426 (1969)
Prestwich, W. V.
Distribution of Charge in Th^{232} and U^{238} Determined by Measurements on Muonic X Rays—R. E. Cote, W. V. Prestwich, A. K. Gaigalas, S. Raboy, C. C. Trail, R. A. Carrigan, Jr., P. D. Gupta, R. B. Sutton, M. N. Suzuki and A. C. Thompson. **179**, 1134 (1969)
Prior, R. M.
Energy Straggling of Alpha Particles through Gases—J. J. Ramirez, R. M. Prior, J. B. Swint, A. R. Quinton and R. A. Blue. **179**, 310 (1969)
Pytte, Agnar
Conductivity Tensor of a Collisional Plasma in a Magnetic Field—Agnar Pytte. **179**, 138 (1969)
Relativistic Corrections to the Conductivity of a Collisional Plasma in a Magnetic Field—John B. McBride and Agnar Pytte. **179**, 145 (1969)

Pytte, E.
Soft Modes, Critical Fluctuations, and Optical Properties for a Two-Valley Model of Gunn-Instability Semiconductors—E. Pytte and H. Thomas. **179**, 431 (1969)
Quinton, A. R.
Energy Straggling of Alpha Particles through Gases—J. J. Ramirez, R. M. Prior, J. B. Swint, A. R. Quinton and R. A. Blue. **179**, 310 (1969)
Rabii, S.
Direct-Transition Optical Absorption in PbS, PbSe, and PbTe from Relativistic Augmented-Plane-Wave Functions—P. T. Bailey, M. W. O'Brien and S. Rabii. **179**, 735 (1969)
Rabl, Arnulf
Perturbation Theory for Magnetic Monopoles—Arnulf Rabl. **179**, 1363 (1969)
Raboy, S.
Distribution of Charge in Th^{232} and U^{238} Determined by Measurements on Muonic X Rays—R. E. Cote, W. V. Prestwich, A. K. Gaigalas, S. Raboy, C. C. Trail, R. A. Carrigan, Jr., P. D. Gupta, R. B. Sutton, M. N. Suzuki and A. C. Thompson. **179**, 1134 (1969)
Rado, George T.
Direct Measurements of Anisotropy Energy and Anisotropic Magnetization in Gallium Iron Oxide—John H. Schelleng and George T. Rado. **179**, 541 (1969)
Rahman, A.
Calculation of Dynamical Surface Properties of Noble-Gas Crystals. II. Molecular Dynamics—R. E. Allen, F. W. de Wette and A. Rahman. **179**, 887 (1969)
Ramchandran, S.
Spins and Widths of Energy Levels in the 5–9-MeV Region—S. Ramchandran and J. A. McIntyre. **179**, 1153 (1969)
Ramirez, J. J.
Energy Straggling of Alpha Particles through Gases—J. J. Ramirez, R. M. Prior, J. B. Swint, A. R. Quinton and R. A. Blue. **179**, 310 (1969)
Ram Mohan, L. R.
Nonleptonic and Weak-Electromagnetic Decays of Hyperons in the Pole Model—L. R. Ram Mohan. **179**, 1561 (1969)
Ramsey, Alan T.
Ground-State Spin of ^{163}Er—Sanford Stein and Alan T. Ramsey. **179**, 1170 (1969)
Ramsey, Norman F.
Improved Upper Limit to the Electric Dipole Moment of the Neutron—J. K. Baird, P. D. Miller, W. B. Dress and Norman F. Ramsey. **179**, 1285 (1969)
Raskin, D.
Interaction between a Neutral Atomic or Molecular Beam and a Conducting Surface—D. Raskin and P. Kusch. **179**, 712 (1969)
Reading, J. F.
Identity for the Total Cross Section in an Inelastic Collision—B. H. Bransden and J. F. Reading. **179**, 982 (1969)
Reed, W. A.
Measurement of the Elastic Constants and Search for Collective Oscillations of the Vortex Lattice in a Type-II Superconductor (Niobium)—P. P. M. Meincke and W. A. Reed. **179**, 463 (1969)
Reeder, D. D.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Reibel, K.
Differential Production Cross Sections of Low-Momentum Particles from 12.3-BeV/c Protons on Beryllium and Copper—G. J. Marmer, K. Reibel, D. M. Schwartz, A. Stevens, R. Winston, D. Wolfe, C. J. Rush, P. R. Phillips, E. C. Swallow and T. A. Romanowski. **179**, 1294 (1969)
Reuter, F. William, III
Oxygen K-Shell X-Ray Production in Thin Films of Aluminum Oxide by 20- to 100-keV Protons—R. R. Hart, F. William Reuter, III, Harold P. Smith, Jr. and J. M. Khan. **179**, 4 (1969)
Richards, P. L.
Far-Infrared Spectra of Al_2O_3 Doped with Ti, V, and Cr—R. R. Joyce and P. L. Richards. **179**, 375 (1969)
Riedinger, L. L.
β- and γ-Vibrational Bands of ^{152}Sm and ^{154}Gd—L. L. Riedinger, Noah R. Johnson and J. H. Hamilton. **179**, 1214 (1969)
Ringler, Heinz
Spectroscopic Measurement of High-Frequency Electric Fields in a Plasma by Observation of Two-Quantum Transitions and Spectral Line Shifts—William S. Cooper III and Heinz Ringler. **179**, 226 (1969)
Roberts, Edwin M.
Use of the Relaxation Function in the Nuclear Magnetic Resonance Analysis of Internal Motions in Solids—Edwin M. Roberts and Charles W. Merideth. **179**, 381 (1969)
Roberts, Louis D.
Solid-State and Nuclear Results from a Measurement of the Pressure Dependence of the Energy of the Resonance Gamma Ray of ^{197}Au—Louis D. Roberts, D. O. Patterson, J. O. Thomson and R. P. Levey. **179**, 656 (1969)
Robinson, Mark T.
Interpretation of Channeled-Ion Energy-Loss Spectra—Mark T. Robinson. **179**, 327 (1969)
Romanowski, T. A.
Differential Production Cross Sections of Low-Momentum Particles from 12.3-BeV/c Protons on Beryllium and Copper—G. J. Marmer, K. Reibel, D. M. Schwartz, A. Stevens, R. Winston, D. Wolfe, C. J. Rush, P. R. Phillips, E. C. Swallow and T. A. Romanowski. **179**, 1294 (1969)
Ross, Marvin
Pressure Calculations and the Virial Theorem for Modified Hartree-Fock Solids and Atoms—Marvin Ross. **179**, 612 (1969)
Routti, J. T.
Electron- and Bremsstrahlung-Induced Fission of Heavy and Medium-Heavy Nuclei—L. G. Moretto, R. C. Gatti, S. G. Thompson, J. T. Routti, J. H. Heisenberg, L. M. Middleman, M. R. Yearian and R. Hofstadter. **179**, 1176 (1969)
Runnalls, N. G.
Charge Distribution in Fission: Fractional Cumulative Fission Yields of ^{143}Ba and ^{144}Ba from Thermal-Neutron-Induced Fission of ^{235}U—N. G. Runnalls, D. E. Troutner and Robert L. Ferguson. **179**, 1188 (1969)
Rush, C. J.
Differential Production Cross Sections of Low-Momentum Particles from 12.3-BeV/c Protons on Beryllium and Copper—G. J. Marmer, K. Reibel, D. M. Schwartz, A. Stevens, R. Winston, D. Wolfe, C. J. Rush, P. R. Phillips, E. C. Swallow and T. A. Romanowski. **179**, 1294 (1969)
Russell, J. P.
Lattice Dynamics and Second-Order Raman Spectrum of NaF—J. R. Hardy, A. M. Karo, I. W. Morrison, C. T. Sennett and J. P. Russell. **179**, 837 (1969)
Santoro, C. J.
Effect of Silver on Diffusion in Zinc—C. J. Santoro. **179**, 593 (1969)
Schelleng, John H.
Direct Measurements of Anisotropy Energy and Anisotropic Magnetization in Gallium Iron Oxide—John H. Schelleng and George T. Rado. **179**, 541 (1969)
Schiffer, J. P.
Multipole Analysis of Particle-Particle or Particle-Hole Multiplets —M. Moinester, J. P. Schiffer and W. P. Alford. **179**, 984 (1969)
Schillaci, M. E.
Pion Production in Nucleon-Nucleon Collisions at Threshold—M. E. Schillaci, R. R. Silbar and J. E. Young. **179**, 1539 (1969)
Kaon Production in p-p Collisions at Threshold—M. E. Schillaci, R. R. Silbar and J. E. Young. **179**, 1546 (1969)

Schmitt, H. W.
Erratum: Fission Energetics and Neutron Emission in 13-MeV Proton-Induced Fission of ^{226}Ra [**172**, 1213 (1968)]—E. Konecny and H. W. Schmitt. **179**, 1232 (1969)
Schneps, J.
π^+ Decay of $_{\Lambda}$He^4—R. E. Phillips and J. Schneps. **179**, 1292 (1969)
Schreiber, D. S.
Low-Temperature Resistivity in a "Giant" Moment Alloy—L. Shen, D. S. Schreiber and A. J. Arko. **179**, 512 (1969)
Schroeder, R. L.
Compressibility of Metal-Ammonia Solutions—R. L. Schroeder and J. C. Thompson. **179**, 124 (1969)
Schultz, P. F.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Schwartz, D. M.
Differential Production Cross Sections of Low-Momentum Particles from 12.3-BeV/c Protons on Beryllium and Copper—G. J. Marmer, K. Reibel, D. M. Schwartz, A. Stevens, R. Winston, D. Wolfe, C. J. Rush, P. R. Phillips, E. C. Swallow and T. A. Romanowski. **179**, 1294 (1969)
Schwarz, John H.
Isovector Electromagnetic Form Factors—John H. Schwarz. **179**, 1486 (1969)
Scofield, James H.
Radiative Decay Rates of Vacancies in the K and L Shells—James H. Scofield. **179**, 9 (1969)
Scully, Marlan O.
Quantum Theory of an Optical Maser. III. Theory of Photoelectron Counting Statistics—Marlan O. Scully and Willis E. Lamb, Jr.. **179**, 368 (1969)
Theory of an Inhomogeneously Broadened Laser Amplifier —Frederic A. Hopf and Marlan O. Scully. **179**, 399 (1969)
Seaborn, J. B.
Nuclear Surface Effects in the Giant Dipole Resonances of Closed-Shell Nuclei—J. B. Seaborn. **179**, 958 (1969)
Seiden, P. E.
Pressure Dependence of the Superconducting Transition Temperature—P. E. Seiden. **179**, 458 (1969)
Sennett, C. T.
Lattice Dynamics and Second-Order Raman Spectrum of NaF—J. R. Hardy, A. M. Karo, I. W. Morrison, C. T. Sennett and J. P. Russell. **179**, 837 (1969)
Setti, R. Levi
Momentum Dependence of Diffraction Slopes in Meson-Nucleon Scattering—T. Lasinski, R. Levi Setti and E. Predazzi. **179**, 1426 (1969)
Sexl, Roman U.
Production of Particles by Gravitational Fields—Roman U. Sexl and Helmuth K. Urbantke. **179**, 1247 (1969)
Shan, Yueh
Bootstrap of ρ-P' Trajectory Using Finite-Energy Sum Rules—Bipin R. Desai, Peter E. Kaus and Yueh Shan. **179**, 1595 (1969)
Shapiro, Joel A.
Narrow-Resonance Model with Regge Behavior for $\pi\pi$ Scattering—Joel A. Shapiro. **179**, 1345 (1969)
Shay, D.
Spin-One Particle in an External Electromagnetic Field—D. Shay and R. H. Good, Jr.. **179**, 1410 (1969)
Shen, L.
Low-Temperature Resistivity in a "Giant" Moment Alloy—L. Shen, D. S. Schreiber and A. J. Arko. **179**, 512 (1969)
Shih, C. C.
Study of the Kinematic Constraints and Factorization in the Regge-Pole Model for Photoproduction Processes—C. C. Shih and Wu-Ki Tung. **179**, 1580 (1969)
Shirane, G.
Critical and Spin-Wave Scattering of Neutrons from Iron—M. F. Collins, V. J. Minkiewicz, R. Nathans, L. Passell and G. Shirane. **179**, 417 (1969)
Shull, C. G.
Single-Slit Diffraction of Neutrons—C. G. **Shull. 179**, 752 (1969)
Shwe, Hla
Neutron Resonances of Mo Isotopes—Hla Shwe and R. E. Coté. **179**, 1148 (1969)
Silbar, R. R.
Pion Production in Nucleon-Nucleon Collisions at Threshold—M. E. Schillaci, R. R. Silbar and J. E. Young. **179**, 1539 (1969)
Kaon Production in p-p Collisions at Threshold—M. E. Schillaci, R. R. Silbar and J. E. Young. **179**, 1546 (1969)
Simpson, J. D.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Slater, J. C.
Comparison of Several Exchange Potentials for Electrons in the Cu^+ Ion—J. C. Slater, Timothy M. Wilson and J. H. Wood. **179**, 28 (1969)
Slusher, R. E.
Photon Echoes in Gases—J. P. Gordon, C. H. Wang, C. K. N. Patel, R. E. Slusher and W. J. Tomlinson. **179**, 294 (1969)
Smith, Felix T.
Diabatic and Adiabatic Representations for Atomic Collision Problems—Felix T. Smith. **179**, 111 (1969)
Smith, Harold P., Jr.
Oxygen K-Shell X-Ray Production in Thin Films of Aluminum Oxide by 20- to 100-keV Protons—R. R. Hart, F. William Reuter, III, Harold P. Smith, Jr., and J. M. Khan. **179**, 4 (1969)
Smith, John E., Jr.
Erratum: Thermal Conductivity of Superconducting Tin Films in a Magnetic Field [167, 345 (1968)] —John E. Smith, Jr., and D. M. Ginsberg. **179**, 592 (1969)
Smith, L. W.
Proton-Proton Triple Scattering at 1.9 GeV—W. C. Carithers, Jr., R. K. Adair, C. J. B. Hawkins, H. Kasha, R. C. Larsen, L. B. Leipuner, L. W. Smith and T. P. Wangler. **179**, 1304 (1969)
Smither, R. K.
Neutron-Capture Gamma-Ray Studies of the Level Structure of the Te^{124} Nucleus—D. L. Bushnell, R. P. Chaturvedi and R. K. Smither. **179**, 1113 (1969)
Snider, D. R.
$O(4)$ Expansion of the Bethe-Salpeter Equation for $\pi\rho$ Scattering—H. M. Lipinski and D. R. Snider. **179**, 1315 (1969)
Snoke, J. Arthur
Overlapping Resonances in Three-Particle Final States: Comments and Corrections—J. Arthur Snoke. **179**, 1620 (1969)
Sobel, M. I.
Proton-Proton Bremsstrahlung Calculations—J. H. McGuire, A. H. Cromer and M. I. Sobel. **179**, 948 (1969)
Solomon, P. R.
Flux Motion in Type-I Superconductors—P. R. Solomon. **179**, 475 (1969)
Somorjai, G. A.
Studies of the Mean Displacement of Surface Atoms in the (100) and (110) Faces of Silver Single Crystals at Low Temperatures—J. M. Morabito, Jr., R. F. Steiger and G. A. Somorjai. **179**, 638 (1969)
Sood, P. C.
Theoretical Description of Energy Levels of ^{59}Fe—P. C. Sood. **179**, 1100 (1969)

Spencer, H. J.
Dynamics of Localized Moments in Metals. I. Kubo Formalism and Relaxation—H. J. Spencer and R. Orbach. **179**, 683 (1969)
Dynamics of Localized Moments in Metals. II. Second-Order Exchange Effects—R. Orbach and H. J. Spencer. **179**, 690 (1969)
Spencer, J. E.
Analysis of Fragmented Analog-State Resonances by Coupled Optical Equations with Effective Nonlocal Potentials—E. C. Bartels, E. R. Cosman, A. K. Kerman and J. E. Spencer. **179**, 995 (1969)
Srinivasan, B.
Xenon and Krypton from the Spontaneous Fission of Californium-252—B. Srinivasan, E. C. Alexander, Jr., O. K. Manuel and D. E. Troutner. **179**, 1166 (1969)
Stachel, John
Pure-Radiation News Function in General Relativity—John Stachel. **179**, 1251 (1969)
Stagat, R.
Separable Approximations to the t Matrix—J. S. Levinger, A. H. Lu and R. Stagat. **179**, 926 (1969)
Stanley, H. E.
Exact Solution for a Linear Chain of Isotropically Interacting Classical Spins of Arbitrary Dimensionality—H. E. Stanley. **179**, 570 (1969)
Steiger, R. F.
Studies of the Mean Displacement of Surface Atoms in the (100) and (110) Faces of Silver Single Crystals at Low Temperatures—J. M. Morabito, Jr., R. F. Steiger and G. A. Somorjai. **179**, 638 (1969)
Stein, Sanford
Ground-State Spin of ^{163}Er—Sanford Stein and Alan T. Ramsey. **179**, 1170 (1969)
Stevens, A.
Differential Production Cross Sections of Low-Momentum Particles from 12.3-BeV/c Protons on Beryllium and Copper—G. J. Marmer, K. Reibel, D. M. Schwartz, A. Stevens, R. Winston, D. Wolfe, C. J. Rush, P. R. Phillips, E. C. Swallow and T. A. Romanowski. **179**, 1294 (1969)
Stukel, D. J.
Self-Consistent Orthogonalized-Plane-Wave and Empirically Refined Orthogonalized-Plane-Wave Energy-Band Models for Cubic ZnS, ZnSe, CdS, and CdSe—D. J. Stukel, R. N. Euwema, T. C. Collins, F. Herman and R. L. Kortum. **179**, 740 (1969)
Subramanian, A.
Erratum: Production of Ω^- Hyperons in K^-p Interactions at 5.5 GeV/c [**168**, 1509 (1968)]—P. F. Schultz, G. Ascoli, E. L. Goldwasser, U. E. Kruse, J. Loos, J. D. Simpson, S. Dagan, R. Ammar, R. Davis, W. Kropac, J. Mott, N. Cason, M. L. Good, R. Hartung, R. Kofler, R. Krauss, Y. Y. Lee, D. D. Reeder and A. Subramanian. **179**, 1632 (1969)
Sutton, R. B.
Distribution of Charge in Th^{232} and U^{238} Determined by Measurements on Muonic X Rays—R. E. Cote, W. V. Prestwich, A. K. Gaigalas, S. Raboy, C. C. Trail, R. A. Carrigan, Jr., P. D. Gupta, R. B. Sutton, M. N. Suzuki and A. C. Thompson. **179**, 1134 (1969)
Suzuki, M. N.
Distribution of Charge in Th^{232} and U^{238} Determined by Measurements on Muonic X Rays—R. E. Cote, W. V. Prestwich, A. K. Gaigalas, S. Raboy, C. C. Trail, R. A. Carrigan, Jr., P. D. Gupta, R. B. Sutton, M. N. Suzuki and A. C. Thompson. **179**, 1134 (1969)
Swallow, E. C.
Differential Production Cross Sections of Low-Momentum Particles from 12.3-BeV/c Protons on Beryllium and Copper—G. J. Marmer, K. Reibel, D. M. Schwartz, A. Stevens, R. Winston, D. Wolfe, C. J. Rush, P. R. Phillips, E. C. Swallow and T. A. Romanowski. **179**, 1294 (1969)
Swint, J. B.
Energy Straggling of Alpha Particles through Gases—J. J. Ramirez, R. M. Prior, J. B. Swint, A. R. Quinton and R. A. Blue. **179**, 310 (1969)
Szöghy, I. M.
Energy Levels in $V^{47,49,51}$ and $Mn^{51,53,55}$ from (He^3,d) Reactions—B. Ćujec and I. M. Szöghy. **179**, 1060 (1969)
Tanaka, K.
Bootstrap Equation and the Cabibbo Angle—K. Tanaka and P. Tarjanne. **179**, 1554 (1969)
Tang, Y. C.
Study of $\alpha+d$ and $\alpha+d^*$ Systems with the Resonating-Group Method—D. R. Thompson and Y. C. Tang. **179**, 971 (1969)
Tankersley, L. L.
Nature of Surface-Induced Nuclear-Spin Relaxation of Gaseous He^3—W. A. Fitzsimmons, L. L. Tankersley and G. K. Walters. **179**, 156 (1969)
Tarjanne, P.
Bootstrap Equation and the Cabibbo Angle—K. Tanaka and P. Tarjanne. **179**, 1554 (1969)
Tassa, M.
Anisotropy of the Europium-Iron Exchange Interaction in Rare-Earth Iron Garnets—U. Atzmony, E. R. Bauminger, A. Mustachi, I. Nowik, S. Ofer and M. Tassa. **179**, 514 (1969)
Thomas, Brian K.
Ionization of Positive Ions—Brian K. Thomas and J. D. Garcia. **179**, 94 (1969)
Thomas, H.
Soft Modes, Critical Fluctuations, and Optical Properties for a Two-Valley Model of Gunn-Instability Semiconductors—E. Pytte and H. Thomas. **179**, 431 (1969)
Thommen, K.
Erratum: Energy and Orientation Dependence of Electron-Irradiation-Induced Damage in Undoped GaSb [**174**, 938 (1968)]—K. Thommen. **179**, 920 (1969)
Thompson, A. C.
Distribution of Charge in Th^{232} and U^{238} Determined by Measurements on Muonic X Rays—R. E. Cote, W. V. Prestwich, A. K. Gaigalas, S. Raboy, C. C. Trail, R. A. Carrigan, Jr., P. D. Gupta, R. B. Sutton, M. N. Suzuki and A. C. Thompson. **179**, 1134 (1969)
Thompson, D. R.
Study of $\alpha+d$ and $\alpha+d^*$ Systems with the Resonating-Group Method—D. R. Thompson and Y. C. Tang. **179**, 971 (1969)
Thompson, J. C.
Compressibility of Metal-Ammonia Solutions—R. L. Schroeder and J. C. Thompson. **179**, 124 (1969)
Thompson, S. G.
Electron- and Bremsstrahlung-Induced Fission of Heavy and Medium-Heavy Nuclei—L. G. Moretto, R. C. Gatti, S. G. Thompson, J. T. Routti, J. H. Heisenberg, L. M. Middleman, M. R. Yearian and R. Hofstadter. **179**, 1176 (1969)
Thomson, J. O.
Solid-State and Nuclear Results from a Measurement of the Pressure Dependence of the Energy of the Resonance Gamma Ray of ^{197}Au—Louis D. Roberts, D. O. Patterson, J. O. Thomson and R. P. Levey. **179**, 656 (1969)
Throop, M. J.
Doppler-Shift Lifetime Measurements in the p and s-d Shells Using Lithium Reactions—M. J. Throop. **179**, 1011 (1969)
Tobocman, W.
Use of the K Matrix in Nuclear Reaction Theories—W. Tobocman and M. A. Nagarajan. **179**, 1230 (1969)
Tomlinson, W. J.
Photon Echoes in Gases—J. P. Gordon, C. H. Wang, C. K. N. Patel, R. E. Slusher and W. J. Tomlinson. **179**, 294 (1969)
Trail, C. C.
Distribution of Charge in Th^{232} and U^{238} Determined by Measurements on Muonic X Rays—R. E. Cote, W. V. Prestwich, A. K. Gaigalas, S. Raboy, C. C. Trail, R. A. Carrigan, Jr., P. D. Gupta, R. B. Sutton, M. N. Suzuki and A. C. Thompson. **179**, 1134 (1969)

Trost, W.
Reaction $^{12}C(^{3}He,d)^{13}N$ and Stripping to Unbound States—H. T. Fortune, T. J. Gray, W. Trost and N. R. Fletcher. **179**, 1033 (1969)
Troutner, D. E.
Xenon and Krypton from the Spontaneous Fission of Californium-252—B. Srinivasan, E. C. Alexander, Jr., O. K. Manuel and D. E. Troutner. **179**, 1166 (1969)
Charge Distribution in Fission: Fractional Cumulative Fission Yields of ^{143}Ba and ^{144}Ba from Thermal-Neutron-Induced Fission of ^{235}U—N. G. Runnalls, D. E. Troutner and Robert L. Ferguson. **179**, 1188 (1969)
Tung, Wu-Ki
Study of the Kinematic Constraints and Factorization in the Regge-Pole Model for Photoproduction Processes—C. C. Shih and Wu-Ki Tung. **179**, 1580 (1969)
Urbantke, Helmuth K.
Production of Particles by Gravitational Fields—Roman U. Sexl and Helmuth K. Urbantke. **179**, 1247 (1969)
van der Woude, A.
Proton-Proton Bremsstrahlung at 65 MeV—D. L. Mason, M. L. Halbert, A. van der Woude and L. C. Northcliffe. **179**, 940 (1969)
van der Ziel, J. P.
Magnon-Assisted Optical Emission in $YCrO_3$ and $LuCrO_3$—J. P. van der Ziel and L. G. Van Uitert. **179**, 343 (1969)
Van Uitert, L. G.
Magnon-Assisted Optical Emission in $YCrO_3$ and $LuCrO_3$—J. P. van der Ziel and L. G. Van Uitert. **179**, 343 (1969)
Varacca, V.
Covalence Effect on the Second Moments of the ESR Absorption Curves. Case of $Na_4[Cu^{II}(NH_3)_4]\times[Cu^{I}(S_2O_3)_2]_2$—E. Buluggiu, A. Dall'olio, G. Dascola and V. Varacca. **179**, 289 (1969)
Velkley, D. E.
Levels of ^{69}Ga and ^{71}Ga via the $(n,n'\gamma)$ Reactions—D. E. Velkley, K. C. Chung, A. Mittler, J. D. Brandenberger and M. T. McEllistrem. **179**, 1090 (1969)
Voss, P.
Experimental Evidence for a Reduction of the Work Function of Blocking Gold Contacts with Increasing Photocurrents in CdS—K. W. Böer, G. A. Dussel and P. Voss. **179**, 703 (1969)
Walters, G. K.
Nature of Surface-Induced Nuclear-Spin Relaxation of Gaseous He^3—W. A. Fitzsimmons, L. L. Tankersley and G. K. Walters. **179**, 156 (1969)
Wanderlingh, F.
Singularities on the Fermi Surface of Bismuth—M. Giura, R. Marcon, T. Papa and F. Wanderlingh. **179**, 645 (1969)
Wang, C. H.
Photon Echoes in Gases—J. P. Gordon, C. H. Wang, C. K. N. Patel, R. E. Slusher and W. J. Tomlinson. **179**, 294 (1969)
Wangler, T. P.
Proton-Proton Triple Scattering at 1.9 GeV—W. C. Carithers, Jr., R. K. Adair, C. J. B. Hawkins, H. Kasha, R. C. Larsen, L. B. Leipuner, L. W. Smith and T. P. Wangler. **179**, 1304 (1969)
Watson, R. E.
Comments on Origin of Solvent Knight Shifts in Alloys—R. E. Watson, L. H. Bennett and A. J. Freemen. **179**, 590 (1969)
Watson, R. L.
K X Rays from Fission Fragments Formed in Association with Long-Range Alpha-Particle Emission—R. L. Watson. **179**, 1109 (1969)
Wertz, John E.
Structure of the Fluorine-Containing Trapped-Hole Center in Magnesium Oxide—William C. O'Mara, J. John Davies and John E. Wertz. **179**, 816 (1969)
West, M. L.
Level Structure in ^{15}O from the Proton Bombardment of ^{14}N—M. L. West, C. M. Jones, J. K. Bair and H. B. Willard. **179**, 1047 (1969)
White, R. L.
Magnetic Davydov Splittings in the Optical Absorption Spectrum of Cr_2O_3—J. W. Allen, R. M. Macfarlane and R. L. White. **179**, 523 (1969)
Whitfield, George
Strong-Coupled Piezoelectric Polaron—Meheryar Engineer and George Whitfield. **179**, 869 (1969)
Willard, H. B.
Level Structure in ^{15}O from the Proton Bombardment of ^{14}N—M. L. West, C. M. Jones, J. K. Bair and H. B. Willard. **179**, 1047 (1969)
Williams, F. I. B.
Relaxation in a Jahn-Teller System. I. Copper in Octahedral Water Coordination—D. P. Breen, D. C. Krupka and F. I. B. Williams. **179**, 241 (1969)
Relaxation in a Jahn-Teller System. II—F. I. B. Williams, D. C. Krupka and D. P. Breen. **179**, 255 (1969)
Williams, I. R.
Excitation Functions for Radioactive Nuclides Produced by Deuteron-Induced Reactions in Iron—J. W. Clark, C. B. Fulmer and I. R. Williams. **179**, 1104 (1969)
Williams, J. F.
Erratum: Measurement of Charge-Transfer Cross Sections for 0.25- to 2.5-MeV Protons and Hydrogen Atoms Incident upon Hydrogen and Helium Gases [**157**, 97 (1967)]—J. F. Williams. **179**, 240 (1969)
Wilson, Kenneth G.
Non-Lagrangian Models of Current Algebra—Kenneth G. Wilson. **179**, 1499 (1969)
Wilson, Timothy M.
Comparison of Several Exchange Potentials for Electrons in the Cu^+ Ion—J. C. Slater, Timothy M. Wilson and J. H. Wood. **179**, 28 (1969)
Winston, R.
Differential Production Cross Sections of Low-Momentum Particles from 12.3-BeV/*c* Protons on Beryllium and Copper—G. J. Marmer, K. Reibel, D. M. Schwartz, A. Stevens, R. Winston, D. Wolfe, C. J. Rush, P. R. Phillips, E. C. Swallow and T. A. Romanowski. **179**, 1294 (1969)
Wintle, H. J.
Kinetics of Dipole Aggregation in $NaCl:CdCl_2$—H. J. Wintle. **179**, 769 (1969)
Wolf, W. P.
Magnetic Interactions between Rare-Earth Ions in Insulators. II. Electron-Paramagnetic-Resonance Measurements of Gd^{3+} Pair and Gd^{3+}-Eu^{3+} Interaction Constags in $EuCl_3$—R. J. Birgeneau, M. T. Hutchings and W. P. Wolf. **179**, 275 (1969)
Wolfe, D.
Differential Production Cross Sections of Low-Momentum Particles from 12.3-BeV/*c* Protons on Beryllium and Copper—G. J. Marmer, K. Reibel, D. M. Schwartz, A. Stevens, R. Winston, D. Wolfe, C. J. Rush, P. R. Phillips, E. C. Swallow and T. A. Romanowski. **179**, 1294 (1969)
Wood, J. H.
Comparison of Several Exchange Potentials for Electrons in the Cu^+ Ion—J. C. Slater, Timothy M. Wilson and J. H. Wood. **179**, 28 (1969)
Wood, R. F.
Point Defects in Ionic Crystals. I. Methods of Calculating the Electronic Structure—U. Öpik and R. F. Wood. **179**, 772 (1969)
Point Defects in Ionic Crystals. II. The *F* Center in KCl, KBr, KI, and NaCl—R. F. Wood and U. Öpik. **179**, 783 (1969)
Wright, Robert M.
Phase-Shift Analysis of High-Precision (p,p) Differential Cross-Section Data at 6.141, 8.097, and 9.918 MeV—Malcolm H. MacGregor, Richard A. Arndt and Robert M. Wright. **179**, 1624 (1969)
Wu, F. Y.
Ising Model with Second-Neighbor Interaction. I. Some Exact Results and an Approximate Solution—Chungpeng Fan and F. Y. Wu. **179**, 560 (1969)

Wyld, H. W., Jr.
Dynamical Calculations of Pseudoscalar and Axial-Vector Meson Parameters using the Relativistic Lippmann-Schwinger Equation—J. Boguta and H. W. Wyld, Jr.. **179**, 1330 (1969)
Yearian, M. R.
Electron- and Bremsstrahlung-Induced Fission of Heavy and Medium-Heavy Nuclei—L. G. Moretto, R. C. Gatti, S. G. Thompson, J. T. Routti, J. H. Heisenberg, L. M. Middleman, M. R. Yearian and R. Hofstadter. **179**, 1176 (1969)
Yntema, J. L.
Study of the $Zr^{94}(He^3,d)Nb^{95}$ Reaction—H. Ohnuma and J. L. Yntema. **179**, 1211 (1969)
Young, J. E.
Pion Production in Nucleon-Nucleon Collisions at Threshold—M. E. Schillaci, R. R. Silbar and J. E. Young. **179**, 1539 (1969)
Kaon Production in *p-p* Collisions at Threshold—M. E. Schillaci, R. R. Silbar and J. E. Young. **179**, 1546 (1969)
Zulliger, H. R.
Energy Loss and Straggling in Silicon by High-Energy Electrons, Positive Pions, and Protons—D. W. Aitken, W. L. Lakin and H. R. Zulliger. **179**, 393 (1969)

AMERICAN INSTITUTE OF PHYSICS

335 East 45 Street New York, New York 10017

THE American Institute of Physics was founded in 1931 as a federation of leading societies in the field of Physics. It combines into one operating agency those functions on behalf of physics that can best be done by the Societies jointly. Its purpose is the advancement and diffusion of the knowledge of physics and its application to human welfare. To this end, it publishes for itself or the Societies the 16 journals listed on this page, as well as the 13 translations of Soviet journals; promotes unity and effectiveness of effort among all who are interested in physics; renders numerous direct services to physicists and to the public; and cooperates with government agencies, national associations, educational institutions, technical industries, and others in such manner as to realize the opportunities and fulfill the responsibilities of physics as an important and constructive human activity.

MEMBER SOCIETIES:

The American Physical Society
W. W. HAVENS, JR., *Executive Secretary*, 335 East 45 Street, New York, N. Y. 10017

Optical Society of America
MARY WARGA, *Executive Secretary*, 2100 Pennsylvania Avenue NW, Washington, D. C. 20037

Acoustical Society of America
WALLACE WATERFALL, *Secretary*, 335 East 45 Street, New York, N. Y. 10017

Society of Rheology
JOHN C. MILLER, *Secretary-Treasurer*, Union Carbide Plastics Co., Bound Brook, N. J. 08805

American Association of Physics Teachers
ALFRED ROMER, *Secretary*, St. Lawrence University, Canton, N. Y. 13617

American Crystallographic Association
WILLIAM L. KEHL, *Secretary*, Gulf Research & Development Co., P.O. Box 2038, Pittsburgh, Pa.

American Astronomical Society
G. C. MCVITTIE, *Secretary*, University of Illinois Observatory, Urbana, Ill.

AFFILIATED SOCIETIES: American Association of Physicists in Medicine · American Institute of Aeronautics and Astronautics · American Society for Metals · American Vacuum Society · Cleveland Physics Society · Division of Physical Chemistry of ACS · Electron Microscopy Society of America · Geological Society of America · Instrument Society of America · Nuclear Science Group of IEEE · Philosophical Society of Washington · Physical Society of Pittsburgh · Physics Club of Chicago · Physics Club of Lehigh Valley · Physics Club of Milwaukee · Physics Club of New York · Physics Club of Philadelphia · Physics Club of Richmond · Society for Applied Spectroscopy

CORPORATE ASSOCIATES: Over 150 leading industrial enterprises and other institutions which contribute to the support of the Institute.

JOURNALS:

The Physical Review • S. PASTERNACK; A. W. K. METZNER; J. R. ROESSER, *Editors*, Brookhaven National Laboratory, Upton, Long Island, N. Y. 11973

Reviews of Modern Physics • E. U. CONDON, *Editor*, Joint Institute for Laboratory Astrophysics, University of Colorado, Boulder, Colo. 80302

Journal of the Optical Society of America • DAVID L. MAC ADAM, *Editor*, 63 Hammond Street, Rochester, N. Y. 14615

The Journal of the Acoustical Society of America • R. BRUCE LINDSAY, *Editor*, Department of Physics, Brown University, Providence, R. I. 02912

American Journal of Physics • FOREST I. BOLEY, *Editor*, Department of Physics, Dartmouth College, Hanover, N. H. 03755

The Journal of Vacuum Science and Technology • FRANKLIN M. PROPST, *Editor*, Coordinated Science Laboratory, University of Illinois, Urbana, Ill. 61803

The Review of Scientific Instruments • J. B. HORNER KUPER, *Editor*, Brookhaven National Laboratory, Upton, Long Island, N. Y. 11973

The Journal of Chemical Physics • J. W. STOUT, *Editor*, Department of Chemistry, The University of Chicago, Chicago, Ill. 60637

Journal of Applied Physics • FRANK E. MYERS, *Editor*, Argonne National Laboratory, Box 296, Argonne, Ill. 60440

Physics Today • R. HOBART ELLIS, *Editor*, American Institute of Physics, 335 East 45 Street, New York, N. Y. 10017

The Physics of Fluids • FRANÇOIS N. FRENKIEL, *Editor*, Applied Mathematics Laboratory, Naval Ship Research and Development Center, Washington, D. C. 20007

Journal of Mathematical Physics • ELLIOTT W. MONTROLL, *Editor*, Physics Department, University of Rochester, Rochester, N. Y. 14627

The Astronomical Journal • L. WOLTJER AND N. H. BAKER, *Editors*, Department of Astronomy, Columbia University, New York, N. Y. 10027

Applied Physics Letters • FRANK E. MYERS, *Editor*, Argonne National Laboratory, Box 296, Argonne, Ill. 60440

Applied Optics • JOHN N. HOWARD, *Editor*, Air Force Cambridge Research Laboratories, Bedford, Mass. 01730

Applied Spectroscopy • JOHN R. FERRARO, *Editor*, Chemistry Division, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, Ill. 60440

TRANSLATION JOURNALS:

Soviet Physics—JETP
Soviet Physics—Solid State
Soviet Physics—Technical Physics
Soviet Physics—Doklady
JETP Letters
Optics and Spectroscopy
Soviet Physics—Semiconductors
Soviet Physics—Acoustics
Soviet Physics—Crystallography
Soviet Physics—Uspekhi
Soviet Astronomy—AJ
Soviet Journal of Nuclear Physics
Soviet Journal of Optical Technology

GOVERNING BOARD

Ralph A. Sawyer, *Chairman*
Luis W. Alvarez
Arnold Arons
Stanley S. Ballard
John Bardeen
H. Richard Crane
Herbert I. Fusfeld
Ronald Geballe
J. E. Goldman
S. A. Goudsmit
W. W. Havens, Jr.
Karl G. Kessler
R. Bruce Lindsay
A. I. Mahan
Vincent E. Parker
S. L. Quimby
Paul M. Routly
Isadore Rudnick
Robert G. Sachs
Frederick Seitz
Robert S. Shankland
Thor L. Smith
A. Francis Turner
Mary E. Warga
Wallace Waterfall
A. E. Whitford
Elizabeth A. Wood
Clarence Zener

GENERAL ADMINISTRATION

H. William Koch
Director
Wallace Waterfall
Secretary
Gerald F. Gilbert
Treasurer and Controller
Lewis Slack
Associate Director, General Activities
Kathryn Setze
Assistant Treasurer
Emily Wolf
Society Services Manager
Dwight E. Gray
Washington Representative

DIRECTORS OF PROFESSIONAL DIVISIONS

Hugh C. Wolfe
Publications
Arthur Herschman
Information
Eugene H. Kone
Public Relations
Charles Weiner
Physics History
A. A. Strassenburg
Education and Manpower
R. H. Ellis, Jr.
Physics Today

PUBLISHING OPERATIONS

Theodore Vorburger
Advertising Manager
David B. Biesel
Editorial Manager
Mitchell Koch
Assistant Editorial Manager
John Di Caro
Fulfillment Manager
Beatrice Nesbitt
Accounting Manager
Margaret R. Pavin
Supervisor, Special Publications
Jo-Ann Wasserman
Supervisor, Journal Publications

Senior Copy Editors

David Ganz
David Hathwell
Joel Shimberg

Copy Editors at AIP

C. M. McLaughlin
B. A. Weismann

4-24-69

ANNOUNCEMENT

Increased Page Charges for the Physical Review

Sharply rising costs have made it necessary for the Council of the American Physical Society to raise the publication charge for papers published in *The Physical Review* from $60 to $75 per printed page. (This is the first such increase since January 1964.) The increased charge will take effect with the issues published in June 1969.

As before, an additional charge of $10 will be requested for publication of the abstract in *Physical Review Letters* and *Physics Abstracts.*

The publication charge for *Physical Review Letters* will remain at $60 per printed page, plus $10 per Letter for supporting abstracting and indexing services.